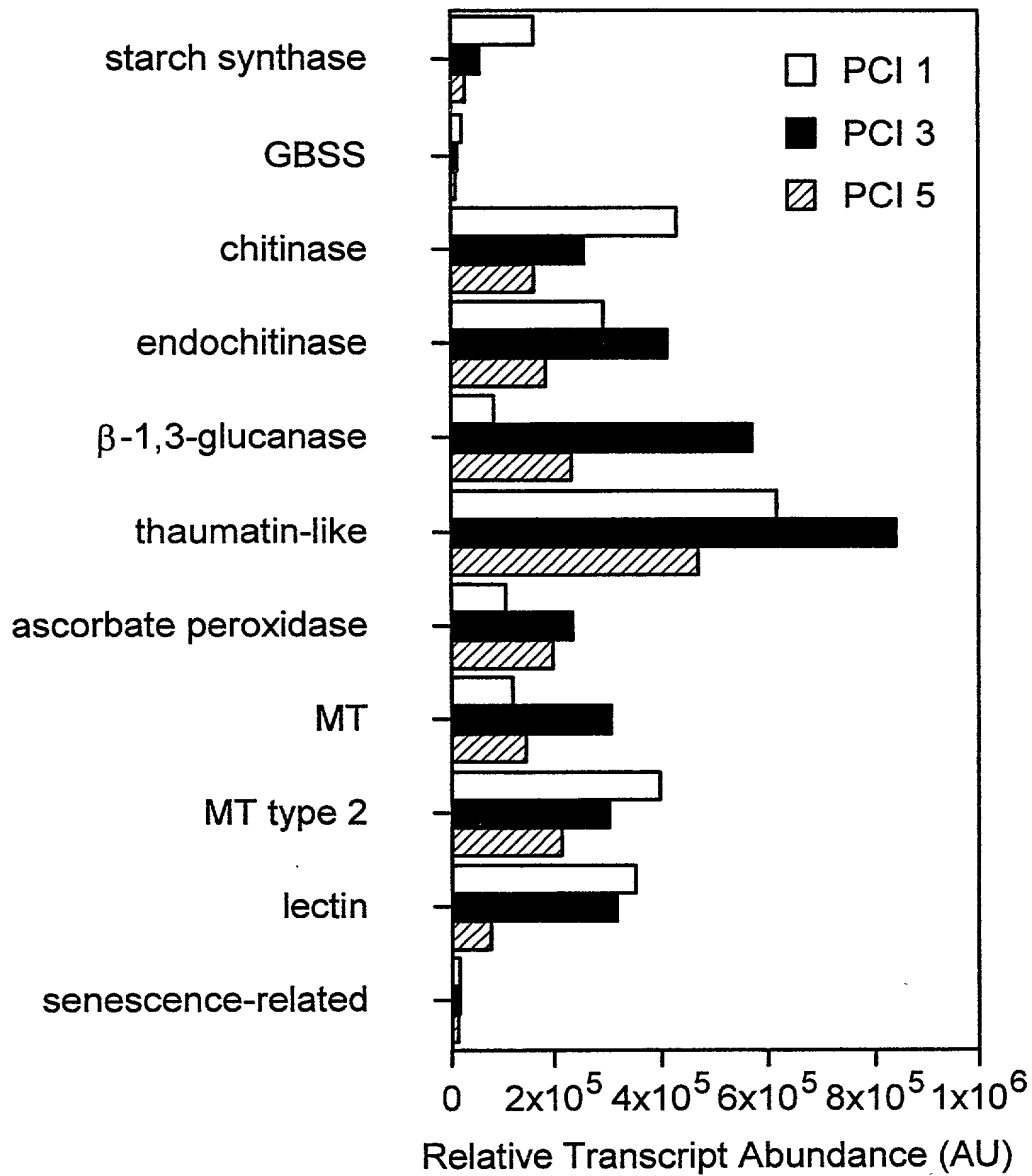


FIG. 1



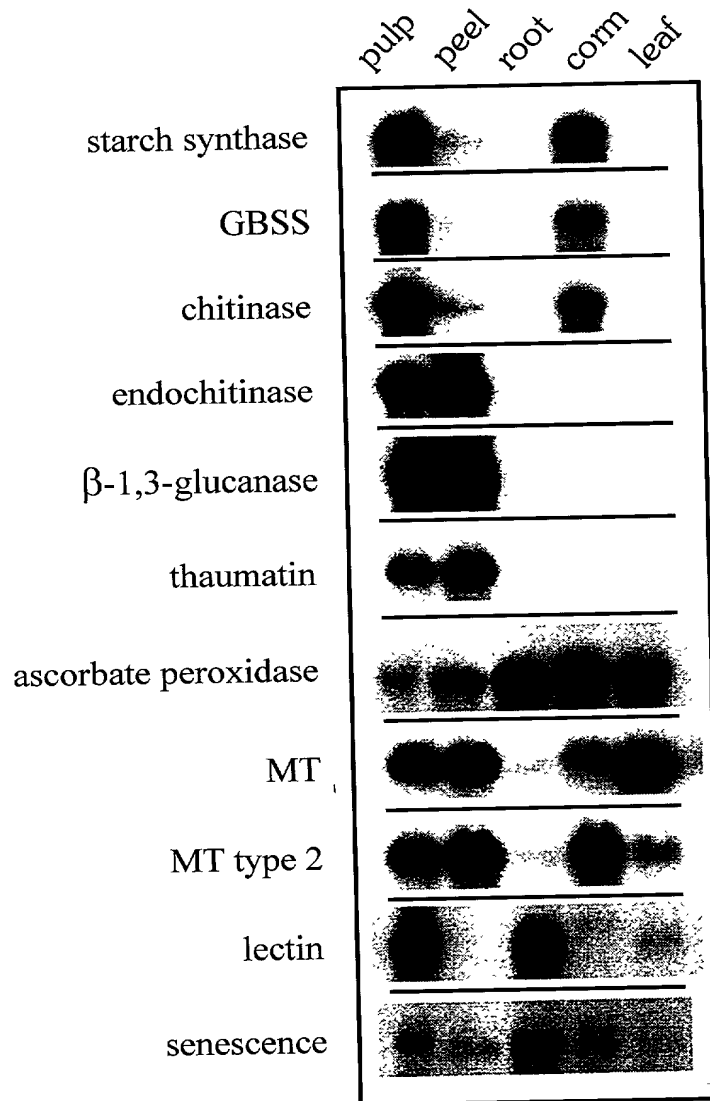


FIG. 2

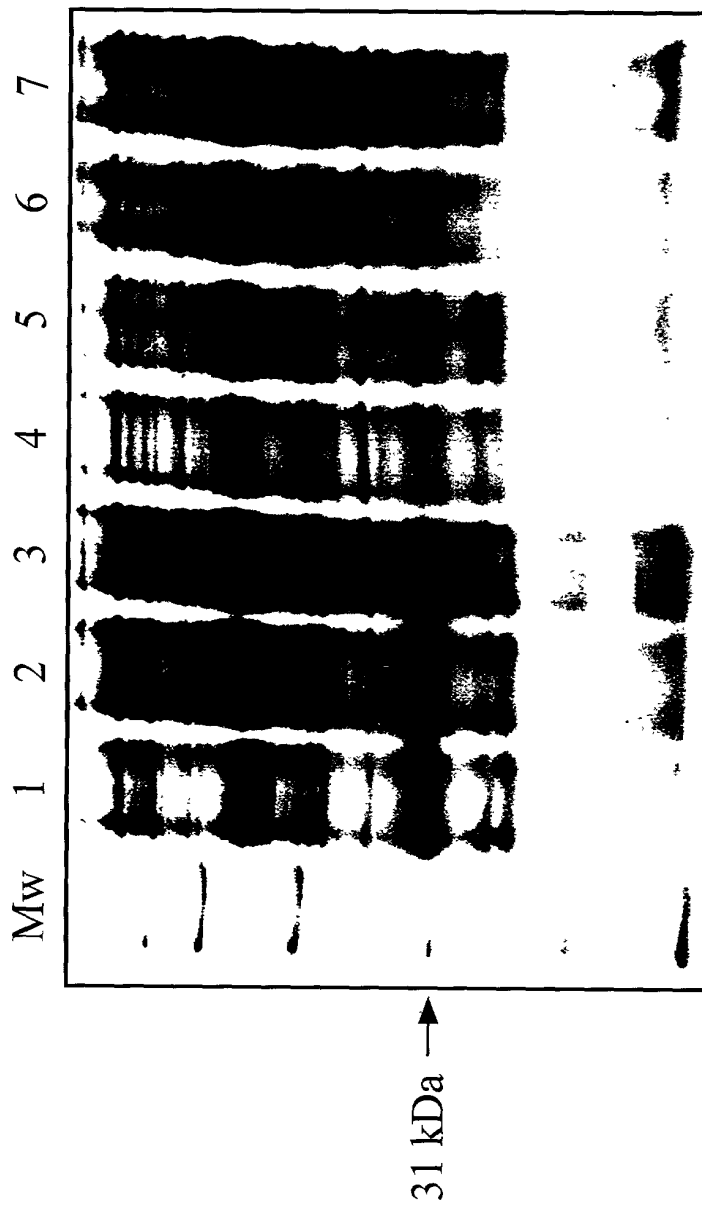


FIG. 3

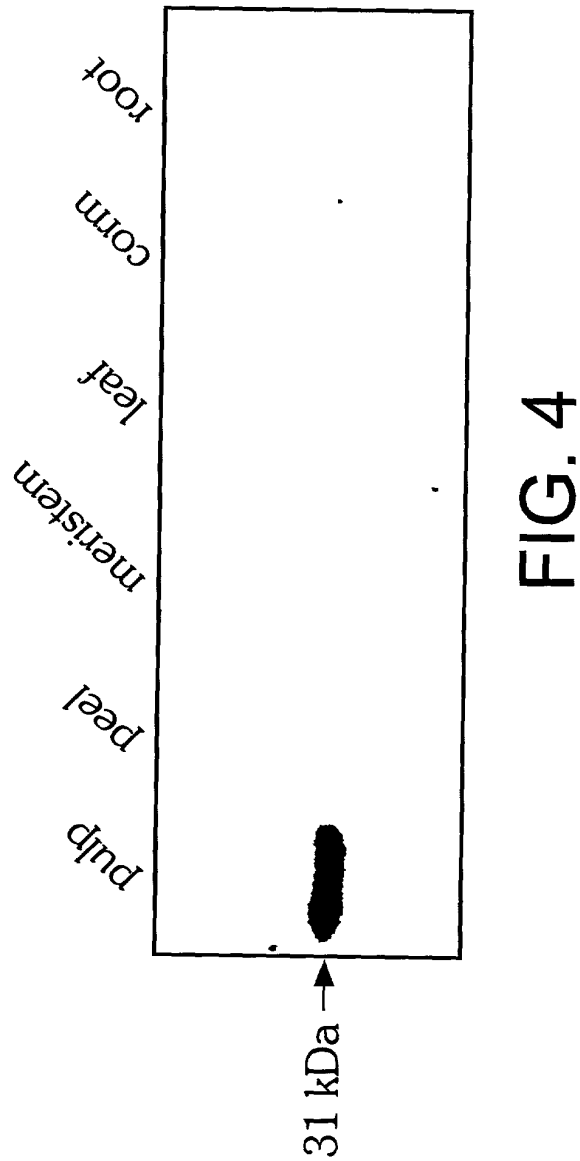


FIG. 4

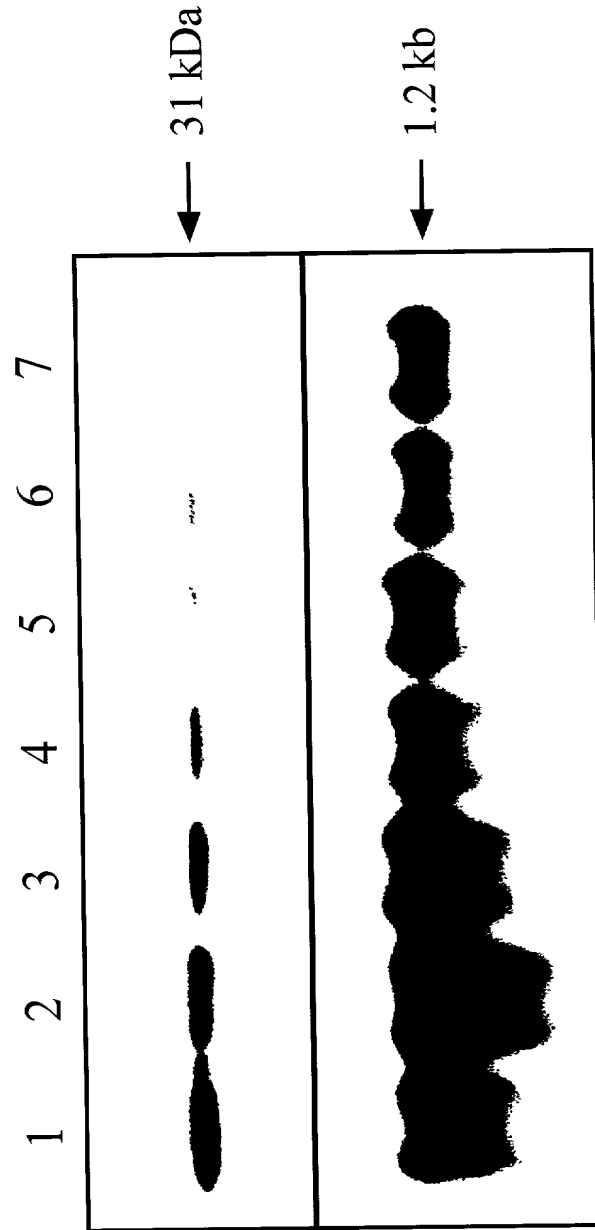


FIG. 5

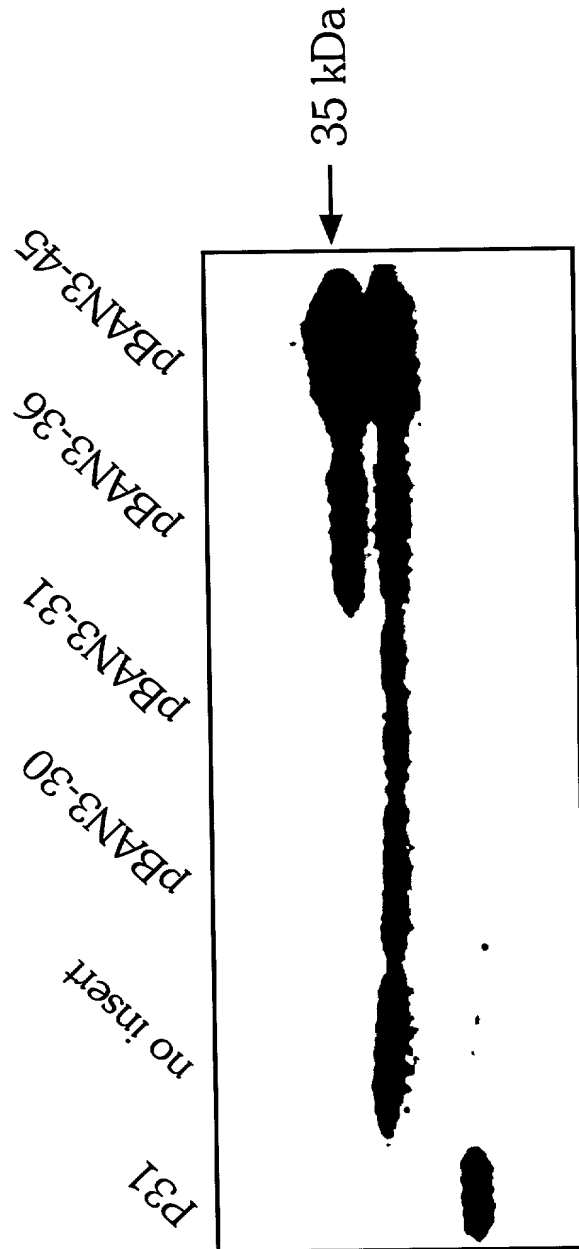


FIG. 6

FIG. 7A

FIG. 7A

TTCAACAATTGGGTCATGTCCATCCCTGCGCAAAAGCTGTTCCTTGGGCT 800  
F N GCTGCTCCCTGAGGCTGCTCCAACTGGTGGCTACATTCACCCCATG L  
TCCTGCTCCCTGAGGCTGCTCCAACTGGTGGCTACATTCACCCCATG L  
ATCTCATATCTAAGTTCCTCGATCCTAAAGGATTCCGACAAAGTACGCA 900  
D L I S K V L P I L K D S D K Y A  
GGAATCATGCTGTGGACTAGATACCAACGACAGAAACTCCGGGCTACAGTTC 950  
G I M L W T R Y H D R N S G Y S  
TCAAGTCAAGTCCCACTGTGTCCAGCGCGTCCGGTTCCTCCAACATCTTAT 1000  
Q V K S H V C P A R R F S N I L  
CTATGCCCGGTGAAGTCTTCCAAAGTAAACCTGAACGGCGTAGATCGGT 1050  
S M P V K S  
GGTCGAATAACTCCGATCGGTCCTCCCAATCCCGTATCCCGTTCGCT 1100  
ACGTTATGGTGTTCCTTCCCAATAAATAAATAAATAAATAAATAAATAA  
GGTTAGTTTACGTTTCCAAATAAATAAATAAATAAATAAATAAATAAATAA

FIG. 7B



BANANA	MAIRSPASLLLFALFLMLALTGRLLQARRSSCIGVYWGQNTDEGSL
CHICKPEA	MEKCFNIIPSL.LISLLIKSSNAAG.A.A.GN.GN.
GRAPE	MARTPQSTPLLS.SVLAL.TSYAGG.AI.GN.T.
ARABIDOPSIS	MTNMTLRKHVIY.L.FISCSSKPSDASRGG.AI.GN.N.
TOBACCO	MIKYS.LLTA.V.FL.ALKLEAGD.VI.GN.
SUGAR BEET	MAAKIVSVLFLIS.LIFASFESSHG.Q.VI.G.

FIG. 8A

BANANA	SDKYAGIMLWTRYHDRNSGYSSQVKSHVCPARRFSNILSMPVKSSK
CHICKPEA	P.G.V.I.D.FN.AQ.NAI.GS
GRAPE	P.G.V.SK.Y.DQ.SI.S
ARABIDOPSIS	R.G.V.SKFW.DKN.SILAS
TOBACCO	P.G.V.SKFY.N.N.AI.AN
SUGAR BEET	A.G.V.SKAY.AI.S

FIG. 8B

৯৬

BANANA F-1	MS - TCGNCDVCV	DK	ATET	FL	G	V
BANANA F-3	MS - TCGNCDVCV	DK	ATET	FL	G	V
KIWIFRUIT	MS - TCGNCDVCV	DK	ATET	FL	G	V
APPLE	MS - TCGNCDVCV	DK	ATET	FL	G	V
PAPAYA	MS - TCGNCDVCV	DK	ATET	FL	G	V
BANANA F-1	VAAEAAEH	MGVP	TS	VS	T	H
BANANA F-3	VAAEAAEH	MGVP	TS	VS	T	H
KIWIFRUIT	VAAEAAEH	MGVP	TS	VS	T	H
APPLE	VAAEAAEH	MGVP	TS	VS	T	H
PAPAYA	VAAEAAEH	MGVP	TS	VS	T	H

FIG. 10A

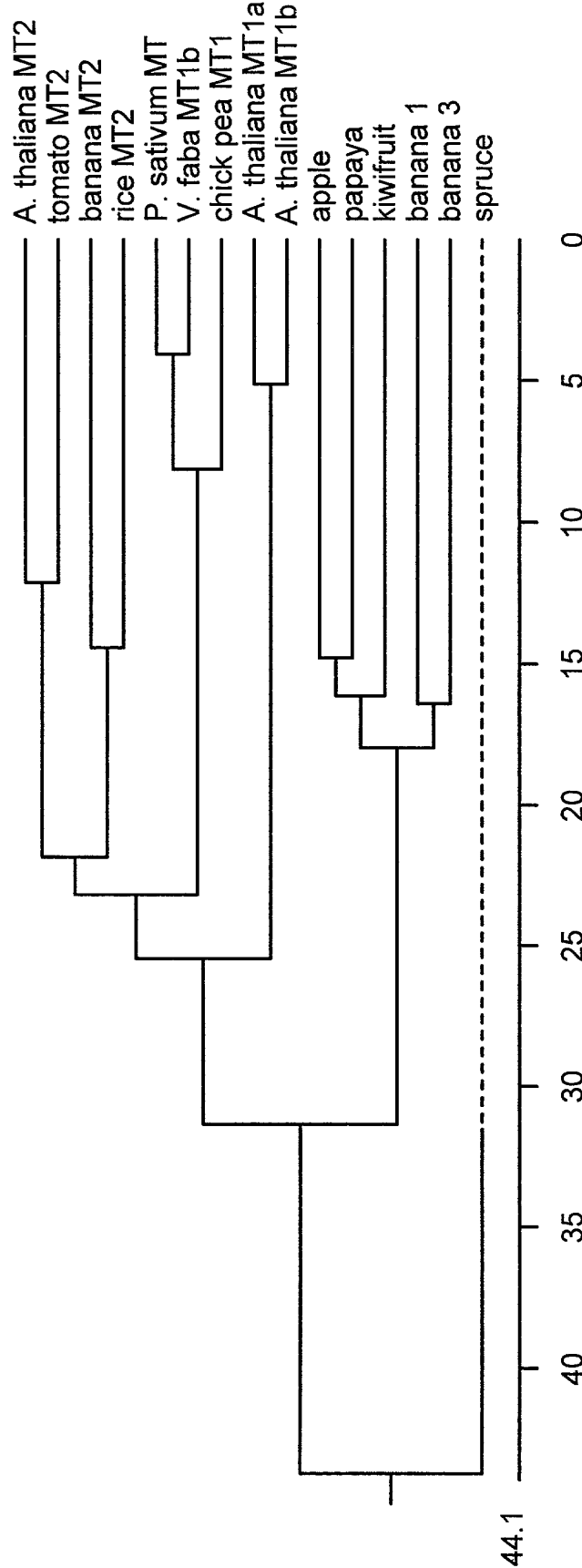


FIG. 10B

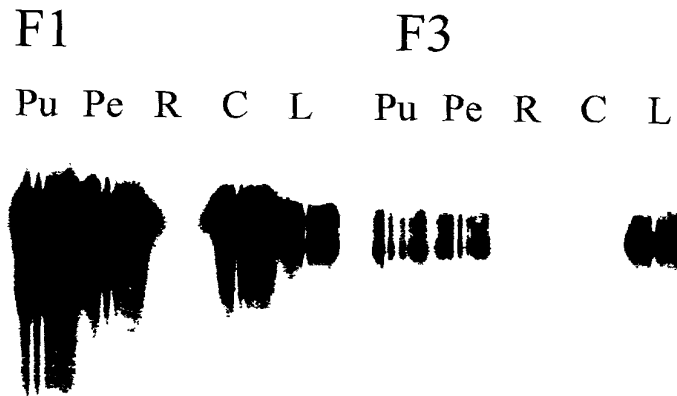
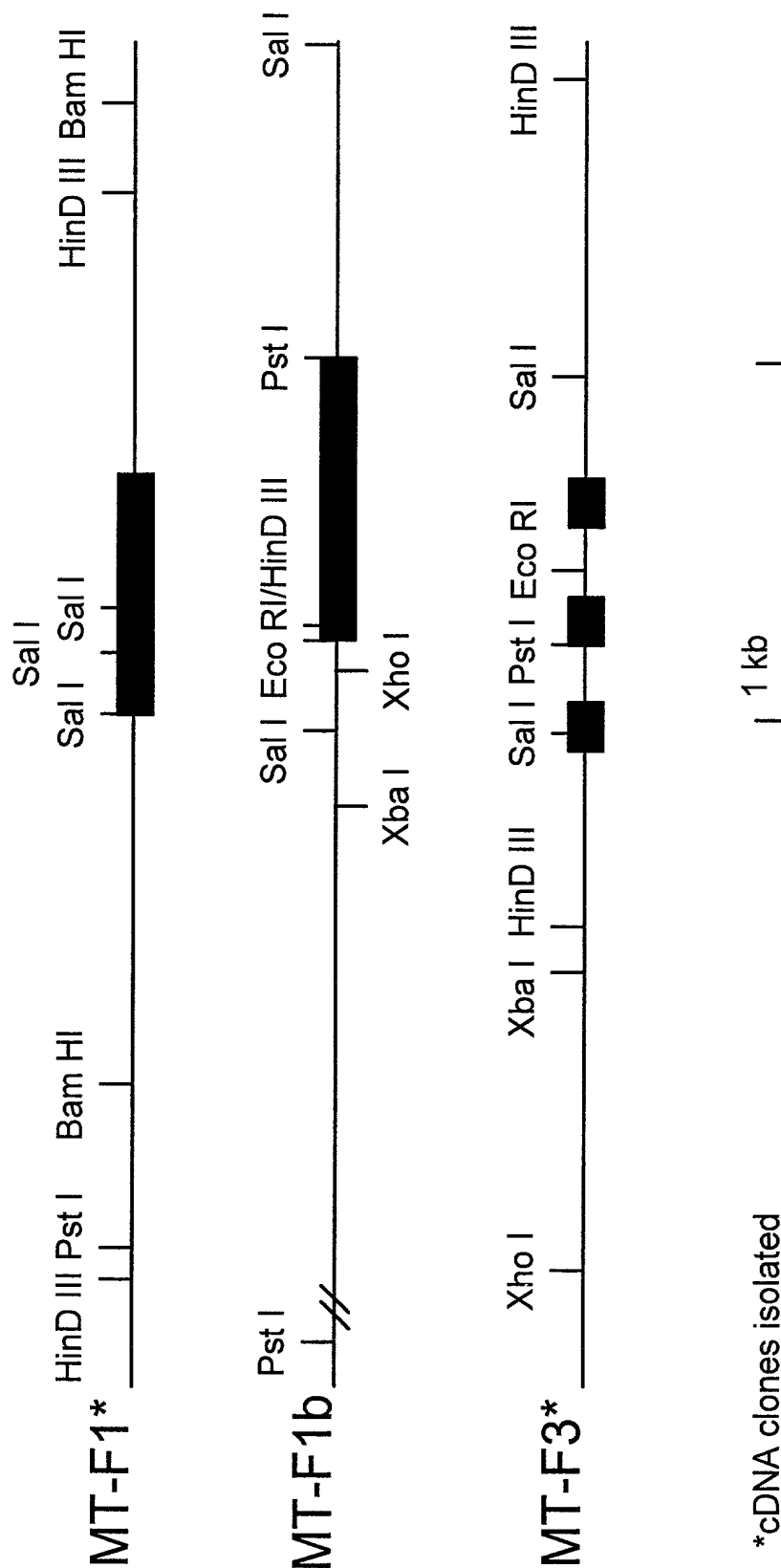


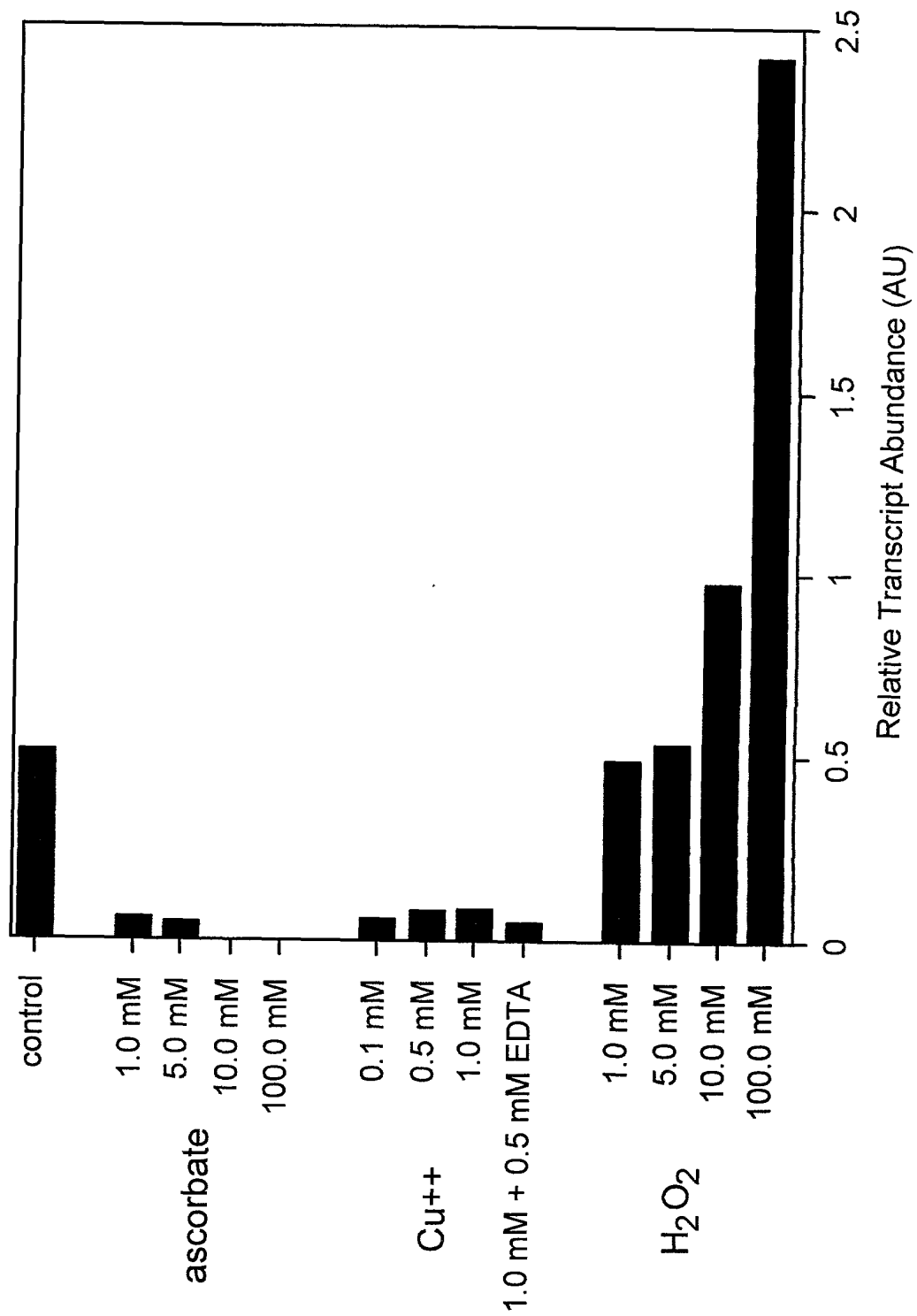
FIG. 11

FIG. 12



F/G.13

FIG. 14





Not I Xba I BamH I Sma I  
ATTGGACCCACGCGGTGGCGGCCGCTCTAGAATAGTGGATCCCCCGGGCT  
TAACCTGGGTGCGCCACCGCCGGCGAGATCTTATCACCTAGGGGGGCCGA  
I G P T R W R P L . N S G S P G L  
L D P R G G G R S R I V D P P G  
N W T H A V A A A L E . W I P R A  
Pst I EcoR I  
GCAGGAATTCTAAAATCTATTCTTTTTTATTTTATTAATTAAATTAAATT  
CGTCCTTAAGATTTTAGATAAGAAAAAATAAAATAATTAATTTAATTTAA  
Q E F . N L F F F I L L I K L N  
C R N S K I Y S F L F Y . L N . I  
A G I L K S I L F Y F I N . I K L  
AATTTTTTATTGTTTGGTATTTAGCCTAACATTCCCGGACTCCTCTATTT  
TTAAAAAATAACAAACCATAAATCGGATTGTAAGGGCCTGAGGAGATAAA  
. F F I V W Y L A . H S R T P L F  
N F L L F G I . P N I P G L L Y F  
I F Y C L V F S L T F P D S S I  
TTGGAGATTGAATACAAAATTCTTCTCCCATCTAAAGTTATTTTAAATTT  
AACCTCTAACTTATGTTTTAAGAAGAGGGTAGATTTCAATAAAATTAAAA  
L E I E Y K I L L P S K V I L I L  
W R L N T K F S H L K L F . F  
F G D . I G N S S P I . S Y F N F  
GAAGATCATATGGCTGACATATAAAGCAAATATGTCAAAGGTAGTTTTCA  
CTTCTAGTATACCGACTGTATATTTTCGTTTATACAGTTTCCATCAAAGT  
K I I W L T Y K A N M S K V V F  
. R S Y G . H I K Q I C Q R . F S  
E D H M A D I . S K Y V K G S F H  
CCGTCCACACGATAGAAACAACAAAGTAGGGTAATTAAATTTGTTCCGTC  
GGCAGGTGTGCTATCTTTGTTGTTTCATCCCATTAATTTAAACAAGGCAG  
T V H T I E T T K . G N . I C S V  
P S T R . K Q Q S R V I K F V P S  
R P H D R N N K V G . L N L F R  
ATCACAAGCACAAACCAAAATATTCACCTTAATCAAATCCTCACTATAA  
TAGTGTTCGTGTTGTGGTTTTATAAGTGAATTAGTTTAGGAGTGATATT  
I T K H N T K I F T . S N P H Y K  
S Q S T T P K Y S L N Q I L T I  
H H K A Q H Q N I H L I K S S L .

FIG. 15A-1

ATAATAATCCTTCAAACTGCAACTCTAAACAATGAGGTTCTCTCTCCCAG  
TATTATTAGGAAGTTTGACGTTGAGATTGTGTTACTCCAAGAGAGAGGGTCT  
S F K L Q L T M R F S L P  
N N N P S N C N S K Q G S L S Q  
I I I L Q T A T L N N E V L S P S  
CAACGTTCTTTTCTGAACACAAAGATTTGCCACAACCTTAGCTGACTTTT  
XXX  
A T F F S E H K D L P Q P L T F  
Q R S F L N T K I C H N L S L L  
N V L F T Q R F A T T L A D F  
AATATCAGTGGTCTCTGGACAAGATTCTTGTTGCACGCTAAAATTTCGAAC  
TTATAGTCACCAGAGACCTGTTCTAAGAACAACGTGCGATTTTAAGCTTG  
N I S G L W T R F L L H A K I R T  
I S V V S G Q D S C C T L K F E  
Y Q W S L D K I L V A R N S N  
TAAAATCAGATCGAGTTATATCCGTAATTGAGATTGATGACCGAACCGAT  
ATTTTAGTCTAGCTCAATATAGGCATTAACCTCTAACTACTGGCTTGGCTA  
K I R S S Y I R N D P N R  
L K S D R V I S V I E I D D R T D  
N Q I E L Y P L R L M T E P I  
TTTAAGAGTACTCTCCGTAACCTGGGATTAATAAAATTAATAAGGTAGGT  
AAATTCTCATGAGAGGCATTGAACCCTAATTATTTTAATTATTCCATCCA  
F E Y S P L G I N K I N K V G  
F K S T L R N L G L I K L I R V  
L R V L S V T W D N G R  
ATCAGTTATTTTAGATGATAAAAATCTTGATAGTTTGAATCTCATCTTAG  
TAGTCAATAAAATCTACTATTTTGTAGAATCTCAAACTTAGAGTAGAATC  
I S Y F R K S F E S H L S  
S V I L D D K N L D S L N L I L  
Y Q L F M I K I L I V I S S  
AGTGAATAAAAATTAATTTTATTATTATTATTAACTAATTAGACTAAC  
TCACTTATTTTAAATTAATAATAATAATAATTTGATTAATCTGATTG  
H L F L I K N N N N N L I N L I  
V T Y F L K I I I I I L I L  
S L I F N K F D S D W

FIG. 15A-2

GAAAAAAAAAAGTTCTCTAGCCATTAAAGTCTGGTAGGACATAGAAATT  
CTTTTTTTTTTTTCAAGAGATCGGTAATTTTCAGACCATCCTGTATCTTTAA  
G K K K S S L A I K V W . D I E I  
E K K K V L . P L K S G R T . K L  
K K K K F S S H . S L V G H R N  
AATGAATTAAACTGTAACCATAAGGTTGAATTTTGAACACATGTACAGG  
T TACTTAATTTGACATTGGTATTCCAACCTTAAAACTTGTGTACATGTCC  
N E L N C N H K V E F L N T C T G  
M N . T V T I R L N F . T H V G  
. . I K L . P . G . I F E H M Y R

FIG. 15A-3

AAAATTGATTTGTTGAAGTCATGTCTAATCAATGCAGCAGTTTACAGCTT  
TTTTAACTAAACAACCTTCAGTACAGATTAGTTACGTCGTCAAATGTTCGAA  
K L I C . S H V . S M Q Q F T A  
E N . F V E V M S N Q C S S L Q L  
K I D L L K S C L I N A A V Y S L  
GGTGTGACTTCCACAACCTATAGGCTTATCCCCTGGGAGTCGAGGATCAAA  
CCACACTGAAGGTGTTGATATCCGAATAGGGGACCCTCAGCTCCTAGTTT  
W C D F H N Y R L I P W E S R I K  
G V T S T T I G L S P G S R G S N  
V . L P Q L . A Y P L G V E D Q  
CGTGTGAGCAATATTCTCCCTTCCTGATGATAAACTATGATGGCTGTTAG  
GCACACTCGTTATAAGAGGGAAGGACTACTATTTGATACTACCGACAATC  
R V S N I L P S . . . T M M A V R  
V . A I F S L P D D K L . W L L  
T C E Q Y S P F L M I N Y D G C .  
GTGTGTAAGCACTCCAAATTTTCCATCAATGTGGAATTGGAAGAGTTCAC  
CACACATTCGTGAGGTTTAAAAGGTAGTTACACCTTAACCTTCTCAAGTG  
C V S T P N F P S M W N W K S S  
G V . A L Q I F H Q C G I G R V H  
V C K H S K F S I N V E L E E F T  
GCACTGACGGACCAACTCGGTTTGTTCAGTCTGGTGACTACTGCTGAGCA  
CGTGACTGCCTGGTTGAGCCAAACAAGTCAGACCACTGATGACGACTCGT  
R T D G P T R F V Q S G D Y C . A  
A L T D Q L G L F S L V T T A E H  
H . R T N S V C S V W . L L L S  
TGAGAAAATGGTTGATGGTAGCAAGTTGCAAATGTACCTGACCTCATCTT  
ACTCTTTTACCAACTACCATCGTTCAACGTTTACATGGACTGGAGTAGAA  
E N G . W . Q V A N V P D L I L  
E K M V D G S K L Q M Y L T S S  
M R K W L M V A S C K C T . P H L  
AAAGACTGTTGATTAGATGCATGCATTGATTACGTCTCTTCCATCTTTAA  
TTTCTGACAACTAATCTACGTACGTAACCTAATGCAGAGAAGGTAGAAATT  
K T V D . M H A L I T S L P S L  
R L L I R C M H . L R L F H L .  
K D C . L D A C I D Y V S S I F N

FIG. 15B-1

CTCTTTTGGATCGATGCATCGTCTTAATTAGGTCAAGGACATGTGATGACA  
GAGAAAAGTACGCTACGTAGCAGAATTAATCCAGTTCCTGTACACTACTGT  
T L L I D A S S . L G Q G H V M T  
L F . S M H R L N . V K D M . . Q  
S F D R C I V L I R S R T C D D  
AGAATCTATTCCACTATTTGTGACCCATATTCCAAATGGAACAAGACTTC  
TCTTAGATAAAGGTGATAAACACTGGGTATAAGGTTTACCTTGTCTGAAG  
R I Y S T I C D P Y S K W N K T S  
E S I P L F V T H I P N G T R L  
K N L F H Y L . P I F Q M E Q D F  
CAAGTCCTCATCCAGAATTTTGGAAAGGATAAGGATGGTGGGGAGAAAGA  
GTTCAGGAGTAGGTCTTAAAACCTTCCCTATTCTACCACCCCTCTTTCT  
K S S S R I L E G I R M V G R K  
P S P H P E F W K G . G W W G E R  
Q V L I Q N F G R D K D G G E K E  
ACAAGCTGTTGCCTTTTCGTTTTCTTCTATCAGGAAGCCAAGAGTTTCAAG  
TGGTCGACAACGGAAAGCAAAAGAAGATAGTCCTTCGTTTCTCAAAGTTC  
N K L L P F V F F Y Q E A K S F K  
T S C C L S F S S I R K P R V S R  
Q A V A F R F L L S G S Q E F Q  
AGGAGGGTAGACCTGAGGGGATGATGCCTGTGTCGAAACCTCTATATAAG  
TCCTCCCATCTGGACTCCCCTACTACGGACACAGCTTTGGAGATATATTC  
R R V D L R G . C L C R N L Y I R  
G G . T . G D D A C V E T S I .  
E E G R P E G M M P V S K P L Y K  
GAGTAGGAACACAGCATGTTGATGAACACAAACCATTTTCAGCGGGGAAGA  
CTCATCCTTGTGTCTGTAACAATACTTTGTGTTTGGTAAAGTCGCCCTTCT  
S R N T A C . . T Q T I S A G K  
G V G T Q H V D E H K P F Q R G R  
E . E H S M L M N T N H F S G E E  
AGAGAACCCTTTTGGACAGAGTTGTTGTCATGGCAACAAAAGCTTCTCTCT  
TCTCTTGGGAAAAGTGTCTCAACAACAGTACCGTTGTTTTCGAAGAGAGA  
K R T L L T E L L S W Q Q K L L S  
R E P F . Q S C C H G N K S F S L  
E N P F D R V V V M A T K A S L

1425

1479

Hind III

FIG. 15B-2

**FIG. 15B-3**

CTCATATTATACATTTGATTGTTAGCTCTTACAAATTTATTAGGGTTTTT  
GAGTATAATATGTAAACTAACAATCGAGAATGTTTAAATAATCCCAAAAA  
S H I I H L I V S S Y K F I R V F  
L I L Y I . L L A L T N L L G F L  
S Y Y T F D C . L L Q I Y . G F  
Hind III  
ATAAGAGTTCAAGCTTTTGGTAATTTAATCATGGTAGGTTATATTTTCAA  
TATTCTCAAGTTTCGAAAACCCTTAAATTAGTACCATCCAATATAAAAGTT  
I R V Q A F G N L I M V G Y I F K  
Y . E F K L L V I . S W . V I F S  
Y K S S S F W . F N H G R L Y F Q  
AACTTGTAACCTGCATTTTGTCTCTTTATTTTCATGCAATATTCTTTTCCT  
TTGAACCTTGGACGTAAACCAGAGAAATAAAGTACGTTATCCGAAAAGGA  
T C N L H F V S L F H A I F F S  
K L V T C I L S L Y F M Q Y S F P  
N L . P A F C L F I S C N I L F L  
TGATTGGCTTACGTCATTTACTTGAGTTAGCTCATATGTAACCTGTTTAAA  
ACTAACCGAATGCAGTAAATGAACTCAATCGAGTATACATTGACAAATTT  
L I G L R H L L E L A H M . L F K  
L A Y V I Y L S . L I C N C L N  
D W L T S F T . V S S Y V T V .  
TATTTGGGATTATTGGTTAACGGATAAAAAAATTAAGATTTTATAGATACA  
CTAAACCCTAATAACCAATTGCCTATTTTTTTTAAATTCTAAAATCTATGT  
Y L G L L V N G . K K L I D F R Y  
I W D Y W L T D K K N . L I L D  
I F G I I G . R I K K I N . F . I  
27 X [TA]  
ATGCTA  
TACGAT  
N A I Y I Y I Y I Y I Y I Y I Y I Y I Y  
T M L Y I Y I Y I Y I Y I Y I Y I Y I Y  
Q C Y I Y I Y I Y I Y I Y I Y I Y I Y  
TATATATATATTATAGGTAGAACTTGGTATAATTCACACGTATGTTTCGC  
ATATATATATAATATCCATCTTTGAACCATATTAAGTGTCCATACAAGCG  
I Y I Y Y R . K L G I I H T Y V R  
Y I Y I I G R N L V . F T R M F A  
I Y I L . V E T W Y N S H V C S

FIG. 15C-1

FIG. 15C-1

TTTATCTGAATAAAATGAGTAGTCCTTTCAATGCAGATTAGTCTTACTCC  
AAATAGACTTATTTTACTCATCAGGAAAGTTACGTCTAATCAGAATGAGG  
F I . I K . V V L S M Q I S L T P  
L S E . N E . S F Q C R L V L L  
L Y L N K M S S P F N A D . S Y S  
ACTTGCAGATGCACGACCAATTTGCTTGATCATCTTCCATAGAGCACCAC  
TGAACGTCTACGTGCTGGTTAAACGAACTAGTAGAAGGTATCTCGTGGTG  
L A D A R P I C L I I F H R A P  
H L Q M H D Q F A . S S S I E H H  
T C R C T T N L L D H L P . S T T

ACA NGA GTG  
T PstI V

AGCTAAGTCTCCGATGTGTTCTACTGCAGGAGTGCAATCGATTGGTGTCT  
TCGATTTCAGAGGCTACACAAGATGACGTCCTCACGTTAGCTAACCACAGA  
Q L S L R C V L L Q E C N R L V S  
S . V S D V F Y C R S A I D W C L  
A K S P M C S T A G V Q S I G V  
GCTACGGAATGCTCGGCAACAATCTTCCCCCGCCCAGCGAGGTGGTCAGT  
CGATGCCTTACGAGCCGTTGTTAGAAGGGGGCGGGTCTCGCTCCACCAGTCA  
A T E C S A T I F P R P A R W S V  
L R N A R Q Q S S P A Q R G G Q  
C Y G M L G N N L P P P S E V V S  
CTCTACAAATCCAACAACATCGCGAGGATGAGACTCTACGATCCAAACCA  
GAGATGTTTAGGTTGTTGTAGCGCTCCTACTCTGAGATGCTAGGTTTGGT  
S T N P T T S R G . D S T I Q T  
S L Q I Q Q H R E D E T L R S K P  
L Y K S N N I A R M R L Y D P N Q

FIG. 15C-2



GGCCGCCCTGCAAGCCCTCAGGAACTCCAACATCCAAGTCCTGTTGGATG  
CCGGCGGGACGTTTCGGGAGTCCTTGAGGTTGTAGGTTTCAGGACAACCTAC  
R P P C K P S G T P T S K S C W M  
G R P A S P Q E L Q H P S P V G C  
A A L Q A L R N S N I Q V L L D  
TCCCCCGATCCGACGTGCAGTCACTGGCCTCCAATCCTTCGGCCGCCGGC  
AGGGGGCTAGGCTGCACGTCACTGACCGGAGGTTAGGAAGCCGGCGGCCG  
S P D P T C S H W P P I L R P P A  
P P I R R A V T G L Q S F G R R  
V P R S D V Q S L A S N P S A A G  
BamH I  
GACTGGATCCGGAGGAACGTCGTCGCCTACTGGCCAGCGTCTCCTTTTCG  
CTGACCTAGGCCTCCTTGACGACGCGGATGACCGGGTCGCAGAGGAAAGC  
T G S G G T S S P T G P A S P F  
R L D P E E R R R L L A Q R L L S  
D W I R R N V V A Y W P S V S F R  
ATACATAGCTGTCGGAAACGAGCTGATCCCCGGATCGGATCTGGCGCAGT  
TATGTATCGACAGCCTTTGCTCGACTAGGGGCCTAGCCTAGACCGCGTCA  
D T . L S E T S . S P D R I W R S  
I H S C R K R A D P R I G S G A V  
Y I A V G N E L I P G S D L A Q

FIG. 15C-3

ACATCCTCCCCGCCATGCGCAACATCTACAATGCTTTGTCCTCGGCTGGC  
TGTAGGAGGGGGCGGTACGCGTTGTAGATGTTACGAAACAGGAGCCGACCG  
T S S P P C A T S T M L C P R L A  
H P P R H A Q H L Q C F V L G W  
Y I L P A M R N I Y N A L S S A G  
Sal I  
CTGCAAAACCAGATCAAGGTCTCGACCGGGTTCGACACGGGCGTCCTCGG  
GACGTTTTTGGTCTAGTTCCAGAGCTGGCGCCAGCTGTGCCCGCAGGAGCC  
C K T R S R S R P R S T R A S S  
P A K P D Q G L D R G R H G R P R  
L Q N Q I K V S T A V D T G V L G  
CACGTCCTACCCTCCCTCCGCCGGCGCCTTCTCCTCCGCCGCCAGGCGT  
GTGCAGGATGGGAGGGAGGCGGCCGCGGAAGAGGAGGCGGGCGGGTCCGCA  
A R P T L P P P A P S P P P P R R  
H V L P S L R R R L L L R R P G V  
T S Y P P S A G A F S S A A Q A  
ACCTGAGCCCCATCGTGCAGTTCTTGGCGAGTAACGGAGCGCCGCTCCTG  
TGGACTCGGGGTAGCACGTCAAGAACCGCTCATTGCCTCGCGGCGAGGAC  
T A P S C S S W R V T E R R S W  
P E P H R A V L G E R S A A P  
Y L S P I V Q F L A S N G A P L L  
Sma I Bgl II  
GTCAATGTGTACCCTTATTTTAGCTACACCGGCAACCCGGGACAGATCTC  
CAGTTACACATGGGAATAAAATCGATGTGGCCGTTGGGCCCTGTCTAGAG  
S M C T L I L A T P A T R D R S  
G Q C V P L F L H R Q P G T D L  
V N V Y P Y F S Y T G N P G Q I S  
GCTGCCCTACGCCCTGTTACGGCCTCCGGCGTCGTCGTGCAGGATGGGC  
CGACGGGATGCGGGACAAGTGCCGGAGGCCGACAGCACGTCTACCCG  
R C P T P C S R P P A S S C R M G  
A A L R P V H G L R R R R A G W A  
L P Y A L F T A S G V V V Q D G  
Sal I  
GATTCAGCTATCAGAACCTGTTTCGACGCCATCGTTCGACGCGGTCTTCGCG  
CTAAGTCGATAGTCTTGGACAAGCTGCGGTAGCAGCTGCGCCAGAAGCGC  
D S A I R T C S T P S S T R S S R  
I Q L S E P V R R H R R R G L R  
R X S Y Q N L F D A I V D A V F A

FIG. 15D-1

CGCGTGGAGAGAGTGGGAGGGGCGAACGTGGCGGTGGTGGTGTCTCGGAGAG  
CGCGACCTCTCTCACCTCCCCGCTTGCACCGCCACCACCACAGCCTCTC  
R W R E W E G R T W R W W C R R  
G A G E S G R G E R G G G G V G E  
A L E R V G G A N V A V V V S E S  
CGGGTGGCCGTCTGGCGGGCGGAGGAGCCGAAGCGAGCACCAGCAACGCGC  
GCCACCGGCAGCCGCCCGCCTCCTCGGCTTCGCTCGTGGTTCGTTGCGCG  
A G G R R R A E E P K R A P A T R  
R V A V G G R R S R S E H Q Q R A  
G W P S A G G G A E A S T S N A  
AGACGTACAACCAGAACTTGATCAGGCATGTTGGCGGAGGAACGCCGAGG  
TCTGCATGTTGGTCTTGAAGTAGTCCGTACAACCGCCTCCTTGCGGCTCC  
R R T T R T S G M L A E E R R G  
D V Q P E L D Q A C W R R N A E  
Q T Y N Q N L I R H V G G G T P R  
AGACCAGGGAAGGAGATCGAGGCATACATATTCGAGATGTTCAACGAGAA  
TCTGGTCCCTTCCTCTAGCTCCGTATGTATAAGCTCTACAAGTTGCTCTT  
D Q G R R S R H T Y S R C S T R  
E T R E G D R G I H I R D V Q R E  
R P G K E I E A Y I F E M F N E N  
CCAGAAGGCTGGAGGGATCGAGCAGAACTTTGGCCTGTTTTATCCCAACA  
GGTCTTCCGACCTCCCTAGCTCGTCTTGAAACCGGACAAAATAGGGTTGT  
T R R L E G S S R T L A C F I P T  
P E G W R D R A E L W P V L S Q Q  
C K A G G I E Q N F G L F Y P N  
Hind III  
AGCAGCCCGTATACCAAATAAGCTTTTAGAAACTAACTTGTAAGGTTGAT  
TCGTCGGGCATATGGTTTATTCGAAAATCTTTGATTGAACATTCCAAC  
S S P Y T K A F R N L V R L M  
A A R I P N K L L E T N L G  
K Q P V Y Q I S F K L T C K V D  
5X[CTAC]  
GAATCATCTCCTACCTACCTACCTACCTACGAATAAAACATGAAATAAAG  
CTTAGTAGAGGATGGATGGATGGATGGATGCTTATTTTGTACTTTATTTC  
N H L L P T Y L P T N K T N K  
I I S Y L P T Y L R I K H E I K  
E S S P T Y L P T Y E N M K S

FIG. 15D-2

EcoRI CDNA EUCLS (POLY A)

CACCAAAATAAAGGGAGAATCTTGATCTTGGAGAAAGTTGAATCATGATG  
GTGGTTTTTATTTCCCTCTTAGAACTAGAACCTCTTTCAACTTAGTACTAC  
A P K . R E N S D L G E S . I M M  
H Q N K G R I L I L E K V E S .  
T N I K G E F . S W R K L N H D  
ATATATAACAAACACCCCTCTTTACTCATTATCAGTATGTTACAAGTTTC  
TATATATTGTTTGTGGGGAGAAATGAGTAATAGTCATCCAATGTTCAAAG  
I Y N K H P S L L I I S M L Q V S  
Y I T N T P L Y S L S V C Y K F  
D I . Q T P L F T H Y Q Y V T S F  
TTGAAACTTGAACGGATCACAATTTGGACCTACAAGTATTTTGGGTCATA  
AACTTTGAACTTGCCTAGTGTTAAACCTGGATGTTTATAAAACCCAGTAT  
N L N G S Q F G P T S I L G H  
L E T . T D H N L D L Q V F W V I  
L K L E R I T X W T Y K Y F G S .  
ATTATTTTCATTGAACTATATATTCAAAAAAAGATGTGTTTGGAGTGCTTA  
TAATAAAGTAACTTGATATATAAGTTTTTTTCTACACAAACCTCACGAAT  
N Y F I E L Y I Q K K M C L E C L  
I I S L N Y I F K K R C V W S A .  
L F H . T I Y S K K D V F G V L  
ATACAGTATGACTTCAGTTTGGCAAGATTACCTCTTCAGCGTCAGCTTCAG  
TATGTCATACTGAAGTCAAACGTTCTAATGGAGAAGTCGCAGTCGAAGTC  
I Q Y D F S L Q D Y L F S V S F S  
Y S M T S V C K I T S S A S A S  
N T V . L Q F A R L P L Q R Q L Q  
CATGCCAAAAAACCATCATCTGCTATGGGGCATGTTTTACACCTTGATGG  
GTACGGTTTTTTTGGTAGTAGACGATACCCCGTACAAAATGTGGAACCTACC  
M P K N H H L L W G M F Y T L M  
A C Q K T I I C Y G A C F T P . W  
H A K K P S S A M G H V L H L D G

FIG. 15E-1

TGCTACATCATCATTCATGTTTTCATTTTCTAGGTCTCGTGCTCTTTATA  
ACGATGTAGTAGTAGTAAGTACAAAGTAAAATCCAGAGCACGAGAAATAT  
V L H H H S C F I L G L V L F I  
C Y I I I H V S F . V S C S L Y  
A T S S S S M F H F R S R A L Y  
TAGATCACATAAAAGTTTGGATCGCTTCAAGTTTCTAGGTTACATTGTAT  
ATCTAGTGTATTTTCAAACCTAGCGAAGTTCAAAGATCCAATGTAACATA  
I T . K F G S L Q V S R L H C M  
R S H K S L D R F K F L G Y I V  
I D H I K V W I A S S F . V T L Y  
GCAGCACTTTGAGCCTACTGAACATTGTGACTGCCTTTTAGAACATTGGA  
CGTCGTGAAACTCGGATGACTTGTAACACTGACGGAATCTTGTAACCT  
Q H F E P T E H C D C L L E H W  
C S T L S L L N I V T A F . N I G  
A A L . A Y . T L . L P F R T L D  
Pst I  
CTGCAGGAA  
GACGTCCTT → 3559  
T A G  
L Q E  
C R K

FIG. 15E-2

Sal I  
 AGCGAGGTCGACTAATGAGCTACTAACATTAATGTCACAGATAGTAATAG  
 TCGCTCCAGCTGATTACTCGATGATTGTAATTACAGTGTCTATCATTATC  
 S E V D . . A T N I N V T D S N R  
 A R S T N E L L T L M S Q I V I  
 Q R G R L M S Y . H . C H R . . .  
 ATGAGAAGCCGTATCCAACACGCAATCTGTANACTTGGTCACAGGACTTC  
 TACTCTTCGGCATAGGTTGTGCGTTAGACATNTGAACCAAGTGTCTCCTGAAG  
 . E A V S N T Q S V ? L V T G L  
 D E K P Y P T R N L ? T W S Q D F  
 M R S R I Q H A I C ? L G H R T S  
 TTATCCAAAGACTCGCCTCTGCGATTTCCACATTTCACCTCATTGTTGGTCC  
 AATAGGTTTCTGAGCGGAGACGCTAAAGGGTGTAAGTGGAGTAAACCAGG  
 L I Q R L A S A I S H I H L I W S  
 L S K D S P L R F P T F T S F G P  
 Y P K T R L C D F P H S P H L V

Hind III  
 ATAGGAAGCTTCACAGCGGGCAGGAATCCATTTCTCTATATAAGCACCAC  
 TATCCTTCGAAGTGTCGCCCGTCCTTAGGTAAAGAGATATATTCGTGGTG  
 I G S F T A G R N P F L Y I S T T  
 . E A S Q R A G I H F S I . A P  
 H R K L H S G Q E S I S L Y K H H  
 CTCCCACCCACACCACCACTACCACTGCTAAGGAGGATGAAGGCCTT  
 GAGGGTGGGTGTGGTGGTGGTGATGGTGACGATTCTCTCTACTTCCGGAA  
 S H P H H H H Y H C . G G . R P  
 P P T H T T T T T T A K E D E G L  
 L P P T P P P L P L L R R M K A L  
 GTTGTGGTTCATCTTTACCCTGGCCTCGTCGCTCGGCGCCTTCGCCGAGC  
 CAACAACCAGTAGAAATGGGACCGGAGCAGCGAGCCGCGGAAGCGGCTCG  
 C C W S S L P W P R R S A P S P S  
 V V G H L Y P G L V A R R L R R A  
 L L V I F T L A S S L G A F A E

FIG. 16A-1

FIG. 16A-1

AATGCGGAAGGCAAGCCGGGGGGGCTCTCTGCCCGGCGGGCTGTGCTGT  
TTACGCCTTCCGTTTCGGCCCCCCCCGAGAGACGGGGCCGCCCCGACACGACA  
N A E G K P G G L S A P A G C A V  
M R K A S R G G S L P R R A V L  
Q C G R Q A G G A L C P G G L C C

BamHI

AGCCAGTACGGCTGGTGCAGTAACACGGATCCATACTGCGGCCAAGGATG  
TCGGTCATGCCGACCACGCCATTGTGCCTAGGTATGACGCCGGTTCCTAC  
A S T A G A V T R I H T A A K D  
P V R L V R H G S I L R P R M  
S Q Y G W C G N T D P Y C G Q G C

CCAGAGCCAATGCGGCGGTAGCGGCGGTAGCGGCGGTGGCAGCGTGGCCT  
GGTCTCGGTTACGCCGCCATCGCCGCCATCGCCGCCACCGTCGCACCGGA  
A R A N A A V A A V A A V A A W P  
P E P M R R R R R R W Q R G L  
Q S Q C G G S G G S G G G S V A

CGATCATCAGCTCCTCCCTCTTCGAGCAGATGCTGAAGCATCGCAACGAC  
GCTAGTAGTCGAGGAGGGAGAAGCTCGTCTACGACTTCGTAGCGTTGCTG  
R S S A P P S S S R C S I A T T  
D H Q L L P L R A D A E A S Q R  
S I I S S S L F E Q M L K H R N D

GCAGCCTGCCCGGCAAGGGTTTCTACACGTACAACGCCTTCATCGCCGC  
CGTCGGACGGGGCCGTTCCCAAAGATGTGCATGTTGCGGAAGTAGCGGCG  
Q P A P A R V S T R T T P S S P  
R S L P R Q G F L H V Q R L H R R  
A A C P G K G F Y T Y N A F I A A

CGCCAACTCCTTCAGCGGGTTCGGGACGACCGGCGACGCCAAGAAGAA  
GCGGTTGAGGAAGTCGCCCAAGCCCTGCTGGCCGCTGCTGGGTTCTTCTT  
P P T P S A G S G R P A T T Q E E  
R Q L L Q R V R D D R R R P K K ?  
A N S F S G F G T T G D D P R R

FIG. 16A-2

NAAGGAGATCGCGGCTTTCTTGGCGCANACGTCTCACGANACGACAGGTA  
NTTCCTCTAGCGCCGAAAGAACC GCGTNTGCAGAGTGCTNTGCTGTCCAT  
? G D R G F L G A ? V S R ? D R .  
K E I A A F L A ? T S H ? T T G  
? R R S R L S W R ? R L T ? R Q V  
ATTCNCACATCTCCCGAAGCTCGTAAACTGTTTATGGGATANAAAAC TGA  
TAAGNGTG TAGAGGGCTTCGAGCATTTGACAAATACCCTATNTTTTGACT  
F ? H L P K L V N C L W D ? K L  
N S H I S R S S . T V Y G I ? N .  
I ? T S P E A R K L F M G ? K T E  
ATGTTTGGGGTTTGGCAGGTGGGTNGGCGACGCGCCCGATGGTCCGTACG  
TACAAACCCCAAACCGTCCACCCANCCGCTGCGCGGGCTACCAGGCATGC  
N V W G L A G G ? A T R P M V R T  
M F G V W Q V G ? R R A R W S V R  
C L G F G R W V G D A P D G P Y  
CCTTGGGTTACTGCTTCGTCCAANAACAAAACCCTCATCGGANTACTGCG  
GGAACCCAATGACGAAGCAGGTTNTTGT TTTGGGAGTAGCCTNATGACGC  
P W V T A S S ? N K T L I G ? L R  
L G L L L R P ? T K P S S ? Y C  
A L G Y C F V Q ? Q N P H R ? T A

FIG. 16A-3



| Pst I

TCCCANCTCCCAN TGGCCGTGCGCTGCAGCAAAAAATACTACGGCCGAAG  
AGGGTNGAGGGTNACCGGCACGCGACGTCGTTTTTTTATGATGCCGGGCTTC  
P ? S ? W P C A A A K N T T A E  
V P ? P ? G R A L Q Q K I L R P K  
P ? L P ? A V R C S K K Y Y G R S  
CCCNTCCAAATTTTCATNGTNAGCCANATTCTNACAGTTCNTCGCCGCGAT  
GGGNAGGTTTAAAGTANCANTCGGTNTAAGANTGTCAAGNAGCGGCGCTA  
A ? P N F ? V S ? I L T V ? R R D  
P ? Q I S ? ? A ? F ? Q F ? A A I  
P S K F H ? ? P ? S ? S S S P R  
CGAGTTCACAACGATGCCNTTTCTAACGCAACAATCCGATGTGTTTNTGCG  
GCTCAAGTGTTGCTACGGNAAAGATTGCGTTGTTAGGCTACACAANACGC  
R V H N D A ? S N A T I R C V ? R  
E F T T M P F L T Q Q S D V ? C  
S S S Q R C ? F . R N N P M C ? A  
TGCAGCAANTACAANTACGGGCCGGCCGGGAGAGCCATCGGTTCNGACNT  
ACGTCGTTNATGTTNATGCCCGGCCGGCCCTCTCGGTAGCCAAGNCTGNA  
A A ? T ? T G R P G E P S V ? T  
V Q Q ? Q ? R A G R E S H R F ? ?  
C S ? Y ? Y G P A G R A I G S D ?  
GNTCAACAACCCAGACCTGGTGGCCACNGACGCGACCATCTCNTTCAAGA  
CNAGTTGTTGGGTCTGGACCACCGGTGNCTGCGCTGGTAGAGNAAGTTCT  
? S T T Q T W W P ? T R P S ? S R  
? Q Q P R P G G H ? R D H L ? Q D  
? N N P D L V A T D A T I S F K  
CGGNTCTGTGGTTTTTGGATGACTCNTCAGTCGCCCAAGCCGTNGTGCCAC  
GCCNAGACACCAAAACCTACTGAGNAGTCAGCGGGTTCGGCANCACGGTG  
R ? C G F G . L ? S R P S R ? A T  
R S V V L D D S S V A Q A V V P  
T ? L W F W M T ? Q S P K P ? C H

FIG. 16B-1

FIG. 16B-1

GACGTGATAACCGGGAGCTGGACGCCATCCAACGCCGACCAGGCGGCCGG  
CTGCACTATTGGCCCTCGACCTGCGGTAGGTTGCGGCTGGTCCGCCGGCC  
T . . P G A G R H P T P T R R P  
R R D N R E L D A I Q R R P G G R  
D V I T G S W T P S N A D Q A A G  
AAGGCTTCCGGGCTACGGTGTCAACCAACATCATCAATGGAGGGTTGG  
TTCCGAAGGCCCGATGCCACAGTGGTGGTTGTAGTAGTTACCTCCCAACC  
E G F R A T V S P P T S S M E G W  
K A S G L R C H H Q H H Q W R V G  
R L P G Y G V T T N I I N G G L  
AGTGCGGGAAAGGGTACGATGCCAGGGTGGCGGATAGGATCGGCTTCTAC  
TCACGCCCTTTCCCATGCTACGGTCCCACCGCCTATCCTAGCCGAAGATG  
S A G K G T M P G W R I G S A S T  
V R E R V R C Q G G G . D R L L  
E C G K G Y D A R V A D R I G F Y  
AAGAGGTACTGCGACTTGCTGGGGGTGAGCTACGGAGACAACTTGGACTG  
TTCTCCATGACGCTGAACGACCCCCACTCGATGCCTCTGTTGAACCTGAC  
R G T A T C W G . A T E T T W T  
Q E V L R L A G G E L R R Q L G L  
K R Y C D L L G V S Y G D N L D C  
CTACAACCAGAGACCCTTTGCTTCTACAGCAGCTACAGCCACATTCTAGC  
GATGTTGGTCTCTGGGAAACGAAGATGTCGTCGATGTCGGTGTAAGATCG  
A T T R D P L L L Q Q L Q P H S S  
L Q P E T L C F Y S S Y S H I L A  
Y N Q R P F A S T A A T A T F .  
GGTGAGCTATGGAGACAACTTGGAGTGCTACAACCAGAGACCCTTTACTT  
CCACTCGATACCTCTGTTGAACCTCACGATGTTGGTCTCTGGGAAATGAA  
G E L W R Q L G V L Q P E T I Y L  
V S Y G D N L E C Y N Q R P F T  
R . A M E T T W S A T T R D P L L

FIG. 16B-2

AGTCCGATACTACTGTGACGAATCCATGTAATAACGCAATAAACGCTATT  
TCAGGCTATGATGACACTGCTTAGGTACATTATTGCGTTATTTGCGATAA  
V R Y Y C D E S M . . R N K R Y  
. S D T T V T N P C N N A I N A I  
S P I L L . R I H V I T Q . T L L  
ACTGAGATAGCGACTCCGTGAGTTGACTGTAGAAGTTGCGGAGGAAGTCT  
TGACTCTATCGCTGAGGCACTCAACTGACATCTTCAACGCCTCCTTCAGA  
Y . D S D S V S . L . K L R R K S  
T E I A T P . V D C R S C G G S L  
L R . R L R E L T V E V A E E V

Hind III

TCAATAAAAGCTTANCTACATACATGGCCCACAACTATCGTTGACCGTGA  
AGTTATTTTTCGAATNGATGTATGTACCGGGTGTTGATAGCAACTGGCACT  
S I K A ? L H T W P T T I V D R D  
Q . K L ? Y I H G P Q L S L T V  
F N K S L ? T Y M A H N Y R . P .  
TCATATGCATCCATCAAATGTCCTCAAATGTCTTGGAGTAAGTAAATGCG  
AGTATACGTAGGTAGTTTACAGGAGTTTACAGAACCTCATTTCATTTACGC  
H M H P S N V L K C L G V S K C  
I I C I H Q M S S N V L E . V N A  
S Y A S I K C P Q M S W S K . M R

FIG. 16B-3

FIG. 16B-3

TATTCGATCGGTAAAATGAAGATGTTAGAATAAATAAAATTAATTATTTT  
ATAAGCTAGCCATTTTACTTCTACAATCTTATTTATTTTAATTAATAAAA  
V F D R . N E D V R I N K I N Y F  
Y S I G K M K M L E . I K L I I F  
I R S V K . R C . N K . N . L F  
TTTATAATTATAAATATTTTAAATATATTTTAAATCTTAAAGATCCTAAA  
AAATATTAATATTTTATAAAAATTATATAAAAAAATTAGAATTTCTAGGATTT  
F I I I N I L I Y F L I L K I L K  
L . L . I F . Y I F . S . R S .  
F Y N Y K Y F N I F F N L K D P K  
AACCCAATTATAAGGATTTTATATATGGATTGGGATACTAAGAATATTTA  
TTGGGTAAATATTCCTAAAATATATACCTAACCTATGATTCTTATAAAT  
I . L . G F Y I W I G I L R I F  
K S N Y K D F I Y G L G Y . E Y L  
N L I I R I L Y M D W D T K N I .  
ATTATAAAAATTAATATACTTTTTAATCTTAAAGATCTAATTATAAGTAT  
TAATATTTTAAATTATATGAAAAATTAGAATTTCTAGATTAATATTCATA  
N Y K N . Y T F . S . R S N Y K Y  
I I K I N I L F N L K D L I I S I  
L . K L I Y F L I L K I . L . V  
TTTCTATATGGATTGGGATATTAACCTCGATTTACTTATAAAAATTTTAAAT  
XXXXXTXTXXXTXXXXXTXTXXTTXXXXTXXXTXXXTXTTTTXXXXTTX  
F L Y G L G Y . L D L L I K I L I  
F Y M D W D I N S I Y L . K F .  
F S I W I G I L T R F T Y K N F N  
ATAAAAATTTTAAATTTAAAAATTAAATACTAAAAATATCTAAATATAA  
TXXXXTTXXXXTTTXXXXTTTXXTTTXXTTTXXTTTXXTTTXXTTTXXTTT  
K F . I . K L K Y . K Y L N I  
Y K N F K F K N . N T K N I . I .  
I K I L N L K I K I L K I S K Y N

Bgl II

FIG. 16C-1

FIG. 16C-1

CGGTAATCATGAGATCGAGAACGTGATGATTGAGATCATGAGATCGAGGT  
GCCATTAGTACTCTAGCTCTTGCACTACTAACTCTAGTACTCTAGCTCCA  
T V I M R S R T . . L R S . D R G  
R . S . D R E R D D . D H E I E V  
G N H E I E N V M I E I M R S R  
TGAGAGTAAAAAGGAAATTACGTTAATCATGGGAAATTTGTTTTGTTTG  
ACTCTCATTTTTTCTTTAATGCAATTAGTACCCTTTAAAGCAAAACAAAC  
. E . K G N Y V N H G K F R F V C  
E S K K E I T L I M G N F V L F  
L R V K R K L R . S W E I S F C L  
CACGGTCGAGATGGTGACCGTGGACACCTAACATCCACAACCGGCATGCA  
GTGCCAGCTCTACCACTGGCACCTGTGGATTGTAGGTGTTGGCCGTACGT  
T V E M V T V D T . H P Q P A C  
A R S R W . P W T P N I H N R H A  
H G R D G D R G H L T S T T G M Q  
ATAACCATGTTGTCATATGTTAGCTTGTCTCATATCTTATGACCATGAAT  
TATTGGTACAACAGTATACAATCGAACAGAGTATAGAATACTGGTACTTA  
N N H V V I C . L V S Y L M T M N  
I T M L S Y V S L S H I L . P . I  
. P C C H M L A C L I S Y D H .  
CACATAGTCTTCACGAATATTAATTAAGCCAGCTTAGCATCACAGTTTTTG  
GTGTATCAGAAGTGCTTATAATTAATTTCGGTCGAATCGTAGTGTCAAAAC  
H I V F T N I N . A S L A S Q F C  
T . S S R I L I K P A . H H S F  
S H S L H E Y . L S Q L S I T V L  
CACCTTTGTACCATANCTGAAGTGTTTCGTATGGCTTGACCCATCCCGAGT  
GTGGAAACATGGTATNGACTTCACAAGCATACCGAACTGGGTAGGGCTCA  
T F V P ? L K C S Y G L T H P E  
A P L Y H ? . S V R M A . P I P S  
H L C T I ? E V F V W L D P S R V

FIG. 16C-2

GTATGGTCTCCCGGANCCTGGAGCGTGTTAACCCGAGGTCTAGTTGAGGG  
CATAACAGAGGGCCTNGGACCTCGCACAAATTGGGCTCCAGATCAACTCCC  
C M V S R ? L E R V N P R S S . G  
V W S P G ? W S V L T R G L V E G  
Y G L P ? P G A C . P E V . L R  
GCATAGACCTTGTTNTCTTAGGGCAGAGGTTGAAGATCACTCCTTTAGCTA  
CGTATCTGGAACAANAGAATCCGTCTCCAACCTTCTAGTGAGGAAATCGAT  
A . T L ? S . A E V E D H S F S Y  
H R P C ? L R Q R L K I T P L A  
G I D L V ? L G R G . R S L L . L  
TCCGTTGGGTGCCTATATAAAGGTCGAAATCATGAGGGGGATTCTNTAACT  
AGGCAACCCACGGATATATTTCCAGCTTTAGTACTCCCCCTAAGNATTGA  
P L G A Y I K V E I M R G I ? N  
I R W V P I . R S K S . G G F ? T  
S V G C L Y K G R N H E G D S . L  
CGACCTATTCAATATTTGAGCTAGCAAGAGTTGGAGTTACGTGTATGAGG  
GCTGGATAAGTTATAAACTCGATCGTTCTCAACCTCAATGCACATACTCC  
S T Y S I F E L A R V G V T C M R  
R P I Q Y L S . Q E L E L R V . G  
D L F N I . A S K S W S Y V Y E  
TTCGACCCCCAATGCTGTTCTGCGGTCGTTTTATACCTATTCCTGCATC  
AAGCTGGGGGTTACGACAAGGACCCAGCAAAATATGGATAAAGGACGTAG  
F D P Q C C S W G R F Y T Y S C M  
S T P N A V P G V A F I P I P A  
V R P P M L F L G S L L Y L F L H  
GTGATCATACATAGTAGCTTTAATCATCTTCAGTCATCATCGTACGTTGG  
CACTAGTATGTATCATCGAAATTAGTAGAAGTCAGTAGTAGCATGCAACC  
S Y I V A L I I F S H H R T L  
C D H T . L . S S S V I I V R W  
V I I H S S F N H L Q S S S Y V G

FIG. 16C-3

GTGCATGCATTGTCTAATTTACTCGATTCAATNTCGTTTCGACACTGCTTC  
CACGTACGTAAACAGATTAAATGAGCTAAGTTANAGCAAGCTGTGACGAAG  
G A C I V . F T R F N ? V R H C F  
V H A L S N L L D S ? S F D T A S  
C M H C L I Y S I Q ? R S T L L

CTACCTACTATGTGGCCCAATACATAGTTGTATTGTCTCATACGGCCTCG  
GATGGATGATACACCGGGTTATGTATCAACATAACAGAGTATGCCGGAGC  
L P T M W P N T . L Y C L I R P R  
Y L L C G P I H S C I V S Y G L  
P T Y Y V A Q Y I V V L S H T A S

AGCAAAGCGTGTGCAGAGGAAGTGTGTCAAGTGGTTGGCTGGCCTCGGGC  
TCGTTTTCGCACACGTCTCCTTGACACAGTTACCAACCGACCGGAGCCCCG  
A K R V Q R N C V K W L A G L G  
E Q S V C R G T V S S G W L A S G  
S K A C A E E L C Q V V G W P R A  
TCATGGCATTGAGTTGGCTCGATACAACACATCGGCTTAGGGATACCATG  
AGTACCGTAACTCAACCGAGCTATGTTGTGTAGCCGAATCCCTATGGTAC  
L M A L S W L D T T H R L R D T M  
S W H . V G S I Q H I G L G I P C  
H G I E L A R Y N T S A . G Y H

CCGAGTCTATTGTGGTAGTTGACATGTCATGTGGGGTGGATGCCAAAATA  
GGCTCAGTTAACACCATCAACTGTACAGTACACCCACCTACGGTTTTAT  
P S L L W . L T C H V G W M P K Y  
R V Y C G S . H V M W G G C Q N  
A E S I V V V D M S C G V D A K I  
TGCTATATCATTCTCTCCCTACAAAGGAGTTGTGCCATAGGAGAATCGTG  
ACGATATAGTAAGAGAGGGATGTTTCCTCAACACGGTATCCTCTTAGCAC  
A I S F S P Y K G V V P . E N R  
M L Y H S L P T K E L C H R R I V  
C Y I I L S L Q R S C A I G E S W

FIG. 16D-1

GACACGGCTTGGGTTCTGTGGTCGGTCCTTGTTCGCCTCAGTTGGGTGGA  
CTGTGCCGAACCCAAGACACCAGCCAGGAACAAGCGGAGTCAACCCACCT  
G H G L G S V V G P C S P Q L G G  
D T A W V L W S V L V R L S W V D  
T R L G F C G R S L F A S V G W  
TTACTTCATCAAGTTGGCCNTCTGTTGGCTGGGCAAAGTACACTTGGTAG  
AATGAAGTAGTTCAACCGGNAGACAACCGACCCGTTTCATGTGAACCATC  
L L H Q V G ? L L A G Q S T L G R  
Y F I K L A ? C W L G K V H L V  
I T S S S W P S V G W A K Y T W .  
GGATGGTCGAGACAAGNCCAAGGAAGGTTGGCTAAGACTTGGTTTTTCGAC  
CCTACCAGCTCTGTTTCNGGTTCTTCCAACCGATTCTGAACCAAAAGCTG  
D G R D K ? K E G W L R L G F R  
G M V E T ? P R K V G . D L V F D  
G W S R Q ? Q G R L A K T W F S T  
AATCAATTGTTTATGAGGCGAATGGTATCCCTCCGTTGGGGTGTCTGCTC  
TTAGTTAACAATACTCCGCTTACCATAGGGAGGCAACCCACAGACGAG  
Q S I V Y E A N G I P P L G C L L  
N Q L F M R R M V S L R W G V C S  
I N C L . G E W Y P S V G V S A  
GTTTCGATTTGTTGCGATGGATTGTTTGTGTAGGAGGCTTGGTTTCGATT  
CAAAGCTAAACAACGCTACCTAACAACAACATCCTCCGAACCAAGCTAA  
V S I C C D G L F V V G G L V R L  
F R F V A M D C L L . E A W F D  
R F D L L R W I V C C R R L G S I  
GCTCTTAAGTCGGGAGAAGGTATTTGNTAAGGAGTTCAATTTGACCATGT  
CGAGAATTCAAXCCCTCTTCCATAAACNATTCCTCAAGTTAAACTGGTACA  
L L S R E K V F ? K E F N L T M  
C S . V G R R Y L ? R S S I . P C  
A L K S G E G I ? . G V Q F D H V

FIG. 16D-2



TGAAGTGAATAAAAGGACTTGCCAAGAAGTTTGGCTCGACCGTGTTAAAG  
ACTTCACTTATTTTCCTGAACGGTTCTTCAAACCGAGCTGGCACAATTTTC  
L K . I K G L A K K F G S T V L K  
S E . K D L P R S L A R P C . S  
E V N K R T C Q E V W L D R V K  
CCAGAGAATGTGTATGTCGAGGTCTATTCAACCATGTGGAAGCTAGAGAA  
GGTCTCTTACACATACAGCTCCAGATAAGTTGGTATACCTTCGATCTCTT  
P E N V Y V E V Y S T M W K L E N  
Q R M C M S R S I Q P C G S . R  
A R E C V C R G L F N H V E A R E  
TGCACCAATTGTGAGGTTTGGCTTGCTCACGTTTAAAGCAGAAGGATATA  
ACGTGGTTAACACTCCAAACCGAACGATTGCAAATTTTCGTCTTCCTATAT  
A P I V R F G L L T F K A E G Y  
M H Q L . G L A C S R L K Q K D I  
C T N C E V W L A H V . S R R I Y  
CTTGCTACGAGGTTTGGCTCAACCATGTGGAAGCAATCAAATGCACTTGCT  
GAACGATGCTCCAAACGAGTTGGTACACCTTCGTTAGTTTACGTGAACGA  
T C Y E V C S T M W K Q S N A L A  
L A T R F A Q P C G S N Q M H L L  
L L R G L L N H V E A I K C T C

FIG. 16D-3

ATGAGGTTTGGCTTGACTTACTCGACAATGGACGCTNGTAAGTGAGAAGG  
 TACTCCAAACCGAACTGAATGAGCTGTTACCTGCGANCATTCACTCTTCC  
 M R F G L T Y S T M D A ? K . E G  
 . G L A . L T R Q W T L V S E K  
 Y E V W L D L L D N G R ? . V R R  
 |Spe I  
 GACTANCCAAGACTTAGTTGGCAAGGACTAGTCGATACTTGCTCGACAAT  
 CTGATNGGTTCTGAATCAACCGTTCCTGATCAGCTATGAACGAGCTGTTA  
 T ? Q D L V G K D . S I L A R Q  
 G L ? K T . L A R T S R Y L L D N  
 D ? P R L S W Q G L V D T C S T I  
 |Sal I  
 AGATGCCTATAGGTAATGGATTGACTGAGACTTAGTCGACAAAGACTAGC  
 TCTACGGATATCCATTACCTAACTGACTCTGAATCAGCTGTTTCTGATCG  
 . M P I G N G L T E T . S T K T S  
 R C L . V M D . L R L S R Q R L A  
 D A Y R . W I D . D L V D K D .  
 |Xho I  
 TGAGACTTAGTGGGCAATGGATGCCTATAAGTAAGAAAGGATGGCTCGAG  
 ACTCTGAATCACCCGTTACCTACGGATGTTCAATTCTTTCCTACCGAGCTC  
 . D L V G N G C L . V R K D G S R  
 E T . W A M D A Y K . E R M A R  
 L R L S G Q W M P I S K K G W L E  
 ATTAATAAAGATCAAATAATTAATATAAATTTATCAAACACTTAATGGAC  
 TAATTATTTCTAGTTTATTAATTATATTTAAATAGTTTGTGAATTACCTG  
 L I K I K . L I . I Y Q T L N G  
 D . . R S N N . Y K F I K H L M D  
 I N K D Q I I N I N L S N T . W T  
 GCATATAAGTGAGAAAGGACGGATCGAGATTAATAAAGATCAAATAATTA  
 CGTATATTCACCTCTTTCCTGCCTAGCTCTAATTATTTCTAGTTTATTAAT  
 R I . V R K D G S R L I K I K . L  
 A Y K . E R T D R D . . R S N N .  
 H I S E K G R I E I N K D Q I I

FIG. 16E-1

ATATAAGTTTATCAAACNCTTATTAANACATTGGACAAAAGAGGTACTAT  
TATATTCAAATAGTTTNGGAATAATTNTGTAACCTGTTTTCTCCATGATA  
I . V Y Q T L I ? T L D K R G T M  
Y K F I K ? L L ? H W T K E V L  
N I S L S N ? Y . ? I G Q K R Y Y  
GTAATATTA AAAATTGGGAGGCACAAATATTATTTCCAAATACTTTTCTCC  
CATTATAATTTTAACCTCCGTGTTTATAATAAAGGTTTATGAAAAGAGG  
. Y . N W E A Q I L F P N T F L  
C N I K I G R H K Y Y F Q I L F S  
V I L K L G G T N I I S K Y F S P  
TTAAGCCCTTCGCCACCATTTGCCATTTTAATCTATTTTTTCTATATAATT  
AATTCGGGAAGCGGTGGTAACGGTAAAATTAGATAAAAAAGATATATTAA  
L K P F A T I A I L I Y F F Y I I  
L S P S P P L P F . S I F S I . L  
. A L R H H C H F N L F F L Y N  
ATCNCATAACATTCGTACATGAGATATGACATAAACCTTCGACCTGCTTT  
TAGNGTATTGTAAGCATGTACTCTATACTGTATTTGGAAGCTGGACGAAA  
I ? . H S Y M R Y D I N L R P A L  
S H N I R T . D M T . T F D L L  
Y ? I T F V H E I . H K P S T C F  
AGTAAACATNTTGATTATNGTGACACCAGAAGCCATAATATTGCTTACCT  
TCATTTGTANAACATAANCACTGTGGTCTTCGGTATTATAACGAATGGA  
V N ? L I ? V T P E A I I L L T  
. T ? . L ? . H Q K P . Y C L P  
S K H ? D Y ? D T R S H N I A Y L  
TAACATGATGGAGATGAACTTTAGTTGGTCCAANTATCTAATNAATGGAA  
ATTGTACTACCTCTACTTGAAATCAACCAGGTTNATAGATTANTTACCTT  
L T . W R . T L V G P ? I . ? M E  
. H D G D E L . L V Q ? S N ? W K  
N M M E M N F S W S ? Y L ? N G

FIG. 16E-2

GTGGACAAGCACGATGACTAGGATGGCTACATGTTTCATGTGTTGACTTTC  
CACCTGTTTCGTGCTACTGATCCTACCGATGTACAAGTACACAACCTGAAAG  
V D K H D D . D G Y M F M C . L S  
W T S T M T R M A T C S C V D F  
S G Q A R . L G W L H V H V L T F  
CAAGTAATCAATCAAGCTGGAATCGAATAAGACGATTAAAGTAGGGCGAT  
GTTTCATTAGTTAGTTTCGACCTTAGCTTATTCTGCTAATTTTCATCCCGCTA  
K . S I K L E S N K T I K V G R  
P S N Q S S W N R I R R L K . G D  
Q V I N Q A G I E . D D . S R A M  
GACCATTAAGTTCAATGTCACGCTCATCAACATAATTCCAACACCGTGCA  
CTGGTAATTCAAGTTACAGTGCGAGTAGTTGTATTAAGGTTGTGGCACGT  
. P L S S M S R S S T . F Q H R A  
D H . V Q C H A H Q H N S N T V Q  
T I K F N V T L I N I I P T P C  
Bgl II  
GAAAGATCTTATCTTACATTGACTTGCCCATCCGGCCGCCGGCATCGATT  
CTTTCTAGAATAGAATGTAACCTGAACGGGTAGGCCGGCGGCCGTAGCTAA  
E R S Y L T L T C P S G R R H R L  
K D L I L H . L A H P A A G I D  
R K I L S Y I D L P I R P P A S I

FIG. 16E-3

FIG. 16E-3

GGCGGAAACGAAGGGTCAGTCTCCCAATTACATTCAAAGGACGAATTCA  
CGGCCTTTGCTTCCCAGTCAGAGGGTTAAGTGTAAGTTTCCTGCTTAAGT  
A E T K G Q S P N S H S K D E F  
W R K R R V S L P I H I Q R T N S  
G G N E G S V S Q F T F K G R I H  
TTTTCATCAGATGAGCACTTCAGTCCTGCTTGATTATATTTTATTATTAT  
AAAAGTAGTCTACTCGTGAAGTCAGGACGAACATAATAAATAATAATA  
I F I R . A L Q S C L I I F Y Y Y  
F S S D E H F S P A . L Y F I I I  
F H Q M S T S V L L D Y I L L L  
TATTATTATTAATTGAATGGTAAGTTTACAGAATATATAGATATTTTAGT  
ATAATAATAATTAACCTTACCATTCAAATGTCTTATATATCTATAAAATCA  
Y Y Y . L N G K F T E Y I D I L V  
I I I N . M V S L Q N I . I F .  
L L L L I E W . V Y R I Y R Y F S  
TTCAATAAAATATTTTAAAAAATGATAAAGGGAGAAGGTGGATTTGATCT  
AAGTTATTTTATAAAATTTTACTATTTCCCTCTTCCACCTAAACTAGA  
S I K Y F K K . . R E K V D L I  
F Q . N I L K N D K G R R W I . S  
F N K I F . K M I K G E G G F D L  
TAGGATTTTTATTGTGAGCAATAAAAGTCTTTAGTTAGAACTTCCAAAAT  
ATCCTAAAAATAACACTCGTTATTTTCAGAAATCAATCTTGAAGGTTTTA  
L G F L L . A I K V F S . N F Q N  
D F Y C E Q . K S L V R T S K M  
R I F I V S N K S L . L E L P K  
GTGTCAAATGAACCCTAATAAGTGGGTTTGGTCTATGGTTACGATGAGAT  
CACAGTTTACTTGGGATTATTCACCCAAACCAGATACCAATGCTACTCTA  
V S N E P . V G L V Y G Y D E I  
C Q M N P N K W V W S M V T M R  
C V K . T L I S G F G L W L R . D

FIG. 16F-1

CAGTATTTGTATATAAAAAAATTATCAACTTGATTTTTTATTTTTTAAACC  
GTCATAAACATATATTTTTTTAATAGTTGAACTAAAAATAAAAAATTGGG  
S I C I . K N Y Q L D F Y F L T  
S V F V Y K K I I N L I F I F . P  
Q Y L Y I K K L S T . F L F F N P  
TTAATAAGTGGACATGATATATCATAATCAAATCATGTGATGTNTGATGA  
AATTATTCACCTGTACTATATAGTATTAGTTTAGTACACTACANACTACT  
L N K W T . Y I I I K S C D V .  
L I S G H D I S . S N H V M ? D E  
. . V D M I Y H N Q I M . C ? M  
GTNATAACATATTTTTTTAATAATNAAAATTATNAATAGAGAAAAATAAG  
CANTATTGTATAAAAAAATTATTANTTTTAATANTTATCTCTTTTTTATTC  
V I T Y F L I ? K I ? N R E K I R  
? . H I F . . ? K L ? I E K K .  
S ? N I F F N N ? K Y ? . R K N K  
ATTACTATCCCTTCTATNGATGTNTTATAATATTTTAATCCCTTTCNATA  
TAATGATAGGGAAGATANCTACANAATATTATAAAATTAGGGAAAGNTAT  
L L S L L ? M ? Y N I L I P F ?  
D Y Y P F Y ? C ? I I F . S L S I  
I T I P S ? D V L . Y F N P F ? Y  
TAGATTACGTAGAATAAGAAAGATTATAATCGCATCAAATCAAATACAG  
ATCTAAGTGCATCTTATTCTTTCTAATATTAGCGTAGTTTAGTTTATGTC  
I D S R R I R K I I I A S N Q I Q  
. I H V E . E R L . S H Q I K Y R  
R F T . N K K D Y N R I K S N T  
AATNAAATCATGCTTTTGA CTTAATTCGAAAAATAATCTTCCTCTCTTGA  
TTANTTTAGTACGAAAAC TGAATTAAGCTTTTTATTAGAAGGAGAGAACT  
N ? I M L L T . F E K . S S S L D  
? K S C F . L N S K N N L P L L  
E ? N H A F D L I R K I I F L S .

FIG. 16F-2

TAATATCCTTATTGATAAGCATTNTTATATATATATATATNTATATCAAC  
ATTATAGGAATAACTATTCGTAANAATATATATATATATANATATAGTTG  
N I L I D K H ? Y I Y I Y ? Y Q  
I I S L L I S I ? I Y I Y ? Y I N  
Y P Y . . A ? L Y I Y I ? I S T  
TTCTAAAANATATTTTTAAATTAATTAAATTTATCAAAATAAAAAGATAA  
AAGATTTTNTATAAAAATTTAATTAATTAAATAGTTTTATTTTTCTATT  
L L K ? I F K L I K F I K I K R .  
F . ? I F L N . L N L S K . K D K  
S K ? Y F . I N . I Y Q N K K I  
ACTAAATTAGTTCTGCATCATAATGTAGTAAGTGTAAAGAACTTGTGAAAT  
TGATTTAATCAAGACGTAGTATTACATCATTACATTCTTGAACACTTTA  
T K L V L H H N V V S V R T C E I  
L N . F C I I M . V . E L V K  
N . I S S A S . C S K C K N L . N  
XbaI SpeI  
ANGGATCTAGAACACTGATAGAAAATTCCAAACCATTACTAGTTCTACTT  
TNCCTAGATCTTGTGACTATCTTTTAAGGTTTGGTAATGATCAAGATGAA  
? I . N T D R K F Q T I T S S T  
? G S R T L I E N S K P L L V L L  
? D L E H . . K I P N H Y . F Y L

FIG. 16F-3

GATGAAAACAAAACCATATAAAAAGAATCCTCTTATATATATATATATATA  
CTACTTTTGTGGTATATTTCTTAGGAGAATATATATATATATATATAT  
K Q N H I K E S S Y I Y I Y I  
D E N K T I K N P L I Y I Y I Y  
M K T K P Y K R I L L Y I Y I Y  
TATACTACTTTACTTATTCTTTGGACGTACAACAAGTCAGGAAACCGA  
ATATGATGAAATGAATAAGAAACCTGCATGTTGTGTTTCAGTCCTTTGGCT  
Y T T L L I L W T Y N T S Q E T E  
I L L Y L F F G R T T Q V R K P  
I Y Y F T Y S L D V Q H K S G N R  
AACAAAGGTGGCGGAAAGTTGGCAGANGCTGAAGAGACTTTTTCGTAGAAG  
TTGTTTCCACCGCCTTTCAACCGTCTNCGACTTCTCTGAAAAGCATCTTC  
T K V A E S W Q ? L K R L F V E  
K Q R W R K V G R ? R D F S K  
N K G G G K L A ? A E E T F R R S  
TGAAGGAGACACACGTCTATAAGAATTGTCATGACTATACGCTGAAGAAA  
ACTTCCTCTGTGTGCAGATATTCTTAACAGTACTGATATGCGACTTCTTT  
V K E T H V Y K N C H D Y T L K K  
R R H T S I R I V M T I R R K  
E G D T R L E L S L Y A E E  
AAGAGGGGAGAGAGAGAGAAGGAAGCGCCACTGTTGACCGGTCTTGTCCA  
TTCTCCCCTCTCTCTCTCTTCTTTCGCGGTGACAACCTGGCCAGAACAGGT  
K R G E R E K E A P L L T G L V H  
R G E R E R R K R H C P V L S  
K E G R E R E G S A T V D R S C P  
Sal I Sal I  
TGAGGAATTGTTTGTGCGACTAATGAGCAGTACAAACATTTGTGTGCGACAG  
ACTCCTTAACAAACAGCTXATTACTCGTCATGTTTGTAAACACAGCTGTC  
E E L F V D A V Q T F V S T  
M R N C L S T N E Q Y K H L C R Q  
G I V C R L M S S T N I C V D R

FIG. 16G-1



Hind III

FIG. 16G-2

GGCTGTGCTGTAGCCAGTACGGCTGGTGC GGTAACACGGATCCATNCTGC  
CCGACACGACATCGGTCATGCCGACCACGCCATTGTGCCTAGGTANGACG  
G L C C S Q Y G W C G N T D P ? C  
G C A V A S T A G A V T R I H ? A  
A V L . P V R L V R . H G S ? L  
GGTCAAGGATGCCANANCCAATGCNCANGCTCCACGCCCTCCCCTTCCAC  
CCAGTTCCTACGGTNTNGGTTACGNGTNCGAGGTGCGGGAGGGGAAGGTG  
G Q G C ? ? Q C ? ? S T P S P S T  
V K D A ? ? N A ? A P R P P L P  
R S R M P ? P M ? ? L H A L P F H  
TCCGAGCGGCGGTGGCANNGTTGGCTCGATCATCATCTCCTCCCTCTTCN  
AGGCTCGCCGCCACCGTNNCAACCGAGCTAGTAGTAGAGGAGGGAGAAGN  
P S G G G ? V G S I I I S S L F  
L R A A V A ? L A R S S S P P S S  
S E R R W ? ? W L D H H L L P L ?  
AGCAGATGCTGAAGCATCNCANCGACNCAGCCNGCCCCGGCAANGGCTTC  
TCGTCTACGACTTCGTAGNGTTGCTGNGTCGGNCGGGGCCGTTNCCGAAG  
? Q M L K H ? ? D ? A ? P G ? G F  
S R C . S I ? ? T Q P A P A ? A S  
A D A E A S ? R ? S ? P R Q ? L

FIG. 16G-3

TACNCGTNCACCGCCTTCATCTCCGCCGCCANCTCCTTCANCGGGTTCGG  
ATGNGCANGTGGCGGAAGTAGAGGCGGCGGTNGAGGAAGTNGCCCAAGCC  
Y ? ? T A F I S A A ? S F ? G F G  
T R ? P P S S P P P ? P S ? G S  
L ? V H R L H L R R ? L L ? R V R  
GACNACCNGCGACCACTCCACNAATAANANGGANATCNCGGCTTTCTTGG  
CTGNTGGNCGCTGGTGAGGTGNTTATTNTNCCTNTAGNGCCGAAAGAACC  
T T ? D H S T N ? ? ? I ? A F L  
G ? P A T T P ? I ? ? ? S R L S W  
D ? ? R P L H ? ? G ? ? G F L G  
TNCNGACNTCTCNCGAGACNACANGTAATCCNTNCNTCTCCCGAGGCTCG  
ANGNCTGNAGAGNGCTCTGNTGTNCATTAGGNANGNAGAGGGCTCCGAGC  
V ? T S ? E T T ? N P ? ? S R G S  
? ? ? L ? R ? ? V I ? ? S P E A R  
? D ? S R D ? ? S ? ? L P R L  
TCTNCAGNTTATNGATAGACANCTNAATGCATTGGGTTNGGCACGTGGGT  
AGANGTCNAATANCTATCTGTNGANTTACGTAACCCAANCCGTGCACCCA  
S ? ? Y ? T ? ? C I G ? G T W V  
L Q ? ? D R ? L N A L G ? A R G  
V ? ? L ? I D ? ? M H W V ? H V G  
GGTCCACCGTGCCCNATGGCCNTTCGCGTGGGGTTACTGCTTCGTCCAGN  
CCAGGTGGCACGGGNTACCGGNAAGCGCACCCCAATGACGAAGCAGGTCTN  
V H R A ? W P F A W G Y C F V Q  
W S T V P ? G ? S R G V T A S S ?  
G P P C P M A ? R V G L L L R P ?  
AACAGAACCCTCATCGGACTACTGCGTCGCCAGCTCGCANTGGCCGTGCG  
TTGTCTTGGGAGTAGCCTGATGACGCAGCGGTGAGCGTNACCGGCACGC  
? Q N P H R T T A S P A R ? G R A  
N R T L I G L L R R Q L A ? A V R  
T E P S S D Y C V A S S ? W P C

FIG. 16H-1

CTGCANGCAANAAATACTACGGCCGAAGCCCCATCCAAATCTCATTCAAC  
GACGTNCGTTNTTTATGATGCCGGCTTCGGGGTAGGTTTAGAGTAAGTTG  
L ? A ? N T T A E A P S K S H S T  
C ? Q ? I L R P K P H P N L I Q  
A A ? ? K Y Y G R S P I Q I S F N  
TACAACTACGGGCGGCGGGAAAACCATCGGCTCCGACCTGCTCAACAA  
ATGTTGATGCCCGGCGGCGCCTTTTGGTAGCCGAGGCTGGACGAGTTGTT  
T T T G R P G K P S A P T C S T  
L Q L R A G R E N H R L R P A Q Q  
Y N Y G P A G K T I G S D L L N N  
CCCAGACCTGGTGGCCACCGACCCGACCATCTCCTTCAAGACGGCTCTGT  
GGGTCTGGACCACCGGTGGCTGGGCTGGTAGAGGAAGTTCTGCCGAGACA  
T Q T W W P P T R P S P S R R L C  
P R P G G H R P D H L L Q D G S V  
P D L V A T D P T I S F K T A L  
GGTTCTGGATGACTCCTCAGTCGCCCAAGCCGTCGTGCCACGACGTGATA  
CCAAGACCTACTGAGGAGTCAGCGGGTTCGGCAGCACGGTGCTGCACTAT  
G S G L L S R P S R R A T T  
V L D D S S V A Q A V V P R R D  
W F W M T P Q S P K P S C H D V I  
ACCGGGAGCTGGACGCCATCCAACGCCGACCGGGCGGCCGGAAGGCTTCC  
TGGCCCTCGACCTGCGGTAGGTTGCGGCTGGCCCGCCGGCCTTCCGAAGG  
P G A G R H P T P T G R P E G F  
N R E L D A I Q R R P G G R K A S  
T G S W T P S N A D R A A G R L P  
GGGCTACGGTGTCAACCAACATCATCAATGGAGGGTTGGAGTGCGGGA  
CCCGATGCCACAGTGGTGGTTGTAGTAGTTACCTCCCAACCTCACGCCCT  
R A T V S P P T S S M E G W S A G  
G L R C H H Q H H Q W R V G V R E  
G Y G V T T N I I N G G L E C G

FIG. 16H-2

AAGGGTCCGATGCCAGGGTGGCGGATAGGATCGGCTTCTACAANAGGTAC  
TTCCCAGGCTACGGTCCCACCGCCTATCCTAGGCGAAGATGTTNTCCATG  
K G P M P G W R I G S A S T ? G T  
R V R C Q G G G . D R L L Q ? V  
K G S D A R V A D R I G F Y ? R Y  
TGCGACTTGCTGGGGGTGAGCTACGGAGACAACTTGGACTGCTACAACCA  
ACGCTGAACGACCCCCACTCGATGCCTCTGTTGAACCTGACGATGTTGGT  
A T C W G . A T E T T W T A T T  
L R L A G G E L R R Q L G L L Q P  
C D L L G V S Y G D N L D C Y N ?  
NAGTCCCTTTACTTANTCCGATACTATGTGCGAATCCATGTAATAACGCA  
NTCAGGGGAAATGAATNAGGCTATGATACACGCTTAGGTACATTATTGCGT  
? V P L L ? R I L C A N P C N N A  
? S L Y L ? R Y Y V R I H V I T Q  
S P F T \* S D T M C E S M . . R  
ATAAACGCTACTGCTGAAATAGCGACTCCGTGAGTTGATTGTAGAAGTTG  
TATTTGCGATGACGACTTTATCGCTGAGGCACTCAACTAACATCTTCAAC  
I N A T A E I A T P . V D C R S C  
N . T L L L K . R L R E L I V E V  
N K R Y C . N S D S V S . L . K L  
POLY A  
CGGAGGAAATCTTCAATAAAAGCTAAGCTGAACAAGTTTCATGGCCCTCAA  
GCCTCCTTTAGAAAGTTATTTTCGATTTCGACTTGTTCAAGTACCGGGAGTT  
G G N L Q . K L S . T S S W P S  
A E E I F N K S . A E Q V H G P Q  
R R K S S I K A K L N K F M A L N  
TCATCGTTGATCGTCGTCAGATGCATCCATCAAATGTCTTGGAGTNAGTN  
AGTAGCAACTAGCAGCAGTCTACGTAGGTAGTTTACAGAACCTCANTCAN  
I I V D R R Q M H P S N V L E ? V  
S S L I V V R C I H Q M S W S ? ?  
H R . S S S D A S I K C L G V S

FIG. 16H-3

AATGCGTTTTTCNATCGGTAAATTGAAGATGTTAGAATAAATAAAATTATT  
TTACGCAAAAAGNTAGCCATTTAACTTCTACAATCTTATTTTATTTTAAATAA  
N A ? S I G K L K M L E . I K L F  
M R ? ? S V N . R C . N K . N Y  
? C V F ? R . I E D V R I N K I I  
TATTTTTTTATAATTATAAATATTTTAAATATATTTTTTTAATCTTAAAGATC  
ATAAAAAAATATTAATATTTTATAAAATTATATAAAAAAATTAGAATTTCTAG  
I F Y N Y K Y F N I F F N L K D  
L F F I I I N I L I Y F L I L K I  
Y F L . L . I F . Y I F . S . R S  
CTAAAAAATCTNATTATAAGGATTTTATATATGGATTGGGATACTAANAA  
GATTTTTTTAGANTAATATTCCTAAAATATATACCTAACCCTATGATTNTT  
P K K S ? Y K D F I Y G L G Y . ?  
L K N L I I R I L Y M D W D T ? K  
. K I ? L . G F Y I W I G I L ?  
AANTTNATTATNAAAATTAATATACTTTTAAATCTTAAGGATCCTAAAAAA  
TTNAANTAATANTTTTAAATTATATGAAAATTAGAATTCCTAGGATTTTTT  
? ? I ? K I N I L L I L R I L K K  
? ? L ? K L I Y F . S . G S . K  
K ? ? Y ? N . Y T F N L K D P K K  
ACATAATTATAAGGATTTTCTATATGGATNGGGATACTAACAANATNTAA  
TGTATTAATATTCCTAAAAGATATACCTANCCCTATGATTGTTNTANATT  
H N Y K D F L Y G ? G Y . Q ? ?  
N I I I R I F Y M D ? D T N ? ?  
T . L . G F S I W ? G I L T ? ? N  
TTGTAAAAATTTNAATATAAAATTGTTAAATCTAAAAATTAATACTAA  
AACATTTTTTAAANTTATATTTTAAACAATTTAGATTTTTTAATTTTATGATT  
I V K I ? I . N C . I . K L K Y .  
L . K F ? Y K I V K S K N . N T K  
C K N ? N I K L L N L K I K I L

BamHI

FIG. 16J-1

AAATATATANTAATCATGATATCGAGAATGTGGCGCTTAGATCTCGAGAT  
TTTATATATNATTAGTACTATAGCTCTTACACCGCGAATCTAGAGCTCTA  
K Y I ? I M I S R M W R L D L E I  
N I ? S Y R E C G A I S R  
K I Y ? N H D I E N V A L R S R D  
CGAGGTTGAGACTANAGNGGAAATTATGTTAATCATGGGAAATTTTCTTT  
GCTCCAACCTCTGATNTCNCCTTTAATACAATTAGTACCCTTTAAAAGAAA  
E V E T ? ? E I M L I M G N F L  
S R L R L ? ? K L C S W E I F F  
R G D ? ? G N Y V N H G K F S F  
TGTTTCCAAGACGATGACCGTGGAAACCTAACATCCGCAATCGGTCATGC  
ACAAAGGTTCTGCTACTGGCACCTTTGGATTGTAGGCGTTAGCCAGTACG  
L F P R R P W K P N I R N R S C  
C F Q D D D R G N L T S A I G H A  
V S K T M T V E T H P Q S V M  
AATAACCATGTTATCATCANTGAACCTTGTCGTCGTCATCTTACGGCCACA  
TTATTGGTACAATAGTAGTNACTTGAACAGCAGCAGTAGAATGCCGGTGT  
N N H V I I ? E L V V V I L R P Q  
I T M L S S ? N L S S S S Y G H  
Q P C Y H ? T C R R H L T A T  
AATCACAGTCTTCTANCAAGGCACGAATATTAATGAGTCCAAGCTAGTAT  
TTAGTGTCAGAAGATNGTTCCGTGCTTATAATTACTCAGGTTTCGATCATA  
I T V F ? Q G T N I N E S N V V  
K S Q S S ? K A R I L M S P T Y  
N H S L L ? R H E Y V Q R S I  
CTATATTGTTTTACATTTTATACCGTANTCGAGGTGTTTCGCACGATTTTG  
GATATAACAAAATGTAAAATATGGCATNAGCTCCACAAGCGTGCTAAAAC  
S I L F Y T F I P ? S R C S H D L  
L Y C F T L L Y R ? R G V R T I W  
Y I V L H F Y T V ? E V F A R F

FIG. 16J-2

GCCTATCCCAAGTGCATAAGATCATTGATATGACCTCTACGTTGGAGCGT  
CGGGTAGGGTTTACGTATTCTAGTAACCTATACTGGAGATGCAAGCTCGCA  
A H P K C I R S L I . P L R W S V  
P I P S A . D H . Y D L Y V G A  
G P S Q V H K I I D M T S T L E R  
| Bgl II  
GTTAACCCGAGATCTAGTTGAGGGGGCATAGGTCTCATTTTNTCTACGTGG  
CAATTGGGCTCTAGATCAACTCCCCCGTATCCAGAGTAAANGGATGCACC  
L T R D L V E G A . V S F ? Y V  
C . P E I . L R G H R S H ? S T W  
V N P R S S . G G I G L I ? L R G  
AGGTAAAGATCACCTTTATTNCANCCCTTG TAGATTCTAAACTNGAGGT  
TCCAATTTCTAGTGGAAATAANGTNGGGAACATCTAAGATTTGANCTCCA  
E V K D H L Y ? ? P C R F . T ? G  
R L K I T F I ? ? L V D S K L E V  
G . R S P L ? ? P L . I L N ? R  
NGATCTCTNTAGGAGATCGGTCTCCCTTGGAACCTCTNTAGGGGTNCC  
NCTAGAGANATCCTCTAGCCAGAGGGGAACCTTGAGANATCCCCANGG  
? S L . E I G L P W N S ? G V P  
D L ? R R S V S L G T L . G ?  
? I S ? G D R S P L E L ? R G ?

FIG. 16J-3



BamH I

GGATCCCAACTTTT TAGGAATGGATCTTAAAATTTT TAGTTATAAGTTCAAA  
CCTAGGGTTGAAAATCCTTACCTAGAAATTTTAAAATCAATATTCAAGTTT  
G S Q L L G M D L K I L V I S S K  
D P N F . E W I L K F . L . V Q  
R I P T F R N G S K N F S Y K F K  
GTTAGAAAAATCTTTACCAAGAGCTTTGAGTCCATTGATGACATCCGTGA  
CAATCTTTTTTAGAAATGGTTCTCGAAACTCAGGTAAGTACTGTAGGCACT  
L E K S L P R A L S P L M T S V  
S . K N L Y Q E L . V H . . H P .  
V R K I F T K S F E S I D D I R E  
AACGGTGTACATGTCTCCGATGGACTCACTTTGGTTTTCATTTCGGAAAAGTT  
TTGCCACATGTACAGAGGCTACCTGAGTGAACCAAAGTAAGCCTTTTCAA  
K R C T C L R W T H L V S F G K V  
N G V H V S D G L T W F H S E K F  
T V Y M S P M D S L G F I R K S  
CGAAAGAGTGCATAAGAATATTGATTTTGGATTCTTTCACTCGGTTGGTG  
GCTTTTCTCACGTATTCTTATAACTAAAACCTAAGAAAGTGAGCCAACCAC  
R K S A . E Y . F W I L S L G W C  
E R V H K N I D F G F F H S V G  
S K E C I R I L I L D S F T R L V  
CCTTCATGAGTGACCTCAAGAGTCCTCCAAATATCAAAAAGCCGAATCACA  
GGAAGTACTCACTGGAGTTCTCAGGAGGTTTATAGTTTTTCGGCTTAGTGT  
L H E . P Q E S S K Y Q K P N H  
A F M S D L K S P P N I K S R I T  
P S . V T S R V L Q I S K A E S Q

EcoR I

AATTGAAATGTGATTGAATTCATTTTTGTCTAATGCACAAAACAGGGCAT  
TTAACTTTACACTAACTTAAGTAAAAACAGATTACGTGTTTTGTCCCGTA  
K L K C D . I H F C L M H K T G H  
N . N V I E F I F V . C T K Q G I  
I E M . L N S F L S N A Q N R A

FIG. 17A-1

TCATAGCCTTTGTGTTTAAAGCAAAAACATTCTTCTCCGATTTCATCCCAT  
AGTATCGGAAACACAAATTTCTGTTTTTGTAAAGAAGAGGCTAAGTAGGGTA  
S . P L C L K Q K H S S P I H P I  
H S L C V . S K N I L L R F I P  
. I A F V F K A K T F F S D S S H  
TCGCTCATCGGAAGAGAAAATTTTGAATCCATTTTTCGACAATAGACCA  
AGCGAGTAGCCTTCTCTTTTAAAAACTTTAGGTAAAAGCTGTTATCTGGT  
R S S E E K I F E I H F R Q . T  
F A H R K R K F L K S I F D N R P  
S L I G R E N F . N P F S T I D Q  
|NcoI  
AAGCTCGAAATCCATGGAAATGAGGAAGATCCTCATATGAGTTTTTCCAAT  
TTCGAGCTTTAGGTACCTTTACTCCTTCTAGGAGTATACTCAAAAAGGTTA  
K A R N P W K . G R S S Y E F S N  
K L E I H G N E E D P H M S F P I  
S S K S M XE M R K I L I . V F Q  
ACATGTAATTCGACTCATTAAACATAGGTGGATGTGTAATGAAATGACCC  
TGTACATTAAGCTGATGAATTTGTATCCACCTACACATTACTTTACTGGG  
T C N S T H . T . V D V . . N D P  
H V I R L I K H R W M C N E M T  
Y M . F D S L N I G G C V M K . P  
TCATGCSCCTATCTCTCTTGGGTATTAAACCAAATATGAGAGTGAGCCTTG  
AGTACGSGATAGAGAGAACCATAATTTGGTTTATACTCTCACTCGGAAC  
H A L S L L G I K P N M R V S L  
L M ? Y L S W V L N Q I . E . A L  
S C ? I S L G Y . T K Y E S E P C  
CTCTGATACCAATTGTTAGGATCAGAGTGGCACTAAGAGAGGGGGGAGA  
GAGACTATGGTTAACAATCCTAGTCTCACCGTGATTCTCTCCCCCCTCT  
A L I P I V R I R V A L R E G G S  
L . Y Q L L G S E W H . E R G G V  
S D T N C . D Q S G T K R G G E

FIG. 17A-2

GAATTAGTGCAGTGGATTAAACTTTATAAGTTTAAAAATGAATTCGTAAA  
CTTAATCACGTCACCTAATTTTGAATATTCAAATTTTACTTAAGCATT  
E L V Q W I K T Y K F K N E F V N  
N . C S G L K L I S L K M N S .  
. I S A V D . N L . V . K . I R K  
TACGAGAAGATTTTCGTTTTAATAGTAACTTGAGTAGATGAAAACCAAAG  
ATGCTCTTCTAAAGCAAAATTATCATTGAACTCATCTACTTTTGGTTTT  
T R R F R F N S N L S R . K P K  
I R E D F V L I V T . V D E N Q K  
Y E K I S F . . L E . M K T S S  
TTAACAGTAGTGTAATAACAATTTTCGGGAAAGTAAGAACTCACACATTC  
AATTGTAATCACATTTATTGTTAAAGCCCTTTCATTCTTGAGTGTGTAAG  
V N S S V N N N F G K V R T H T F  
L T V V . I T I S G K . E L T H S  
. Q . C K . Q F R E S K N S H I  
AAGGAACATACCAATTTTAAAGTGGTTTCGGTCAAAATGACCTACATCCACT  
TTCCTTGTATGGTTAAATTTACCAAGCCAGTTTTACTGGATGTAGGTGA  
K E H T N L K W F G Q N D L H P L  
R N I P I . S G S V K M T Y I H  
Q G T Y Q F K V V R S K . P T S T

EcoRI

FIG. 17A-3

TGTGAAGCCTTCTTCGAAGAGGCTCCCAACTTCCACTAGCAAATCACTTT  
ACACTTCGGAAGAAGCTTCTCCGAGGGTTGAAGGTGATCGTTTAGTGAAA  
V K P S S K R L P T S T S K S L  
L . S L L R R G S Q L P L A N H F  
C E A F F E E A P N F H . Q I T L  
GAAGGGGAAGGACAAATACCTCTCTTACNACCTTTTACAATGGTTCATAC  
CTTCCCCTTCTGTTTATGGAGAGAATGNTGGAAAATGTTACCAAGTATG  
. R G R T N T S L T T F Y N G S Y  
E G E G Q I P L L ? P F T M V H T  
K G K D K Y L S Y ? L L Q W F I  
TCTTACAAATTTTCAACGAGAAAGAAGGAGGTGAACATGCAAGCAATTGA  
AGAATGTTTAAAAGTTGCTCTTTCTTCTCCTCCACTTGTACGTTTCGTTAACT  
S Y K F S T R K K E V N M Q A I E  
L T N F Q R E R R R . T C K Q L  
L L Q I F N E K E G G E H A S N .  
AAACAAGACTTGCTAAAGACTTTGCTAAGGCTTTTTTTTCTCAATCTATTG  
TTTGTTCTGAACGATTTCTGAAACGXTTCCGAAAAAAGAGTTAGATAAC  
N K T C . R L C . G F F S Q S I  
K T R L A K D F A K A F F L N L L  
K Q D L L R T L L R L F F S I Y C  
CTTCTCAAAAGTTGTATTCTCTGCTGAGAATTGAGGGGTATTTATAGACC  
GAAGAGTTTTTCAACATAAGAGACGACTCTTAACCTCCCATAAATATCTGG  
A S Q K L Y S L L R I E G Y L . T  
L L K S C I L C . E L R G I Y R P  
F S K V V F S A E N . G V F I D  
CCAAGAGGATTTAAATTTGGGCTCCAAATTTTGAATGCTCTTGGGTTCCC  
GGTTCTCCTAAATTTAAACCCGAGGTTTAAAGCTTACGAGAACCCAAGGG  
P R G F K F G L Q I S N A L G F P  
Q E D L N L G S K F R M L L G S  
P K R I . I W A P N F E C S W V P

FIG. 17B-1

GAGGTTGCCGGTGCCACCGCCTGTCAGTGTTTGACACTGGACAGTGTACT  
CTCCAACGGCCACGGTGGCGGACAGTCACAAACTGTGACCTGTCACATGA  
R L P V P P P V S V . H W T V Y  
R G C R C H R L S V F D T G Q C T  
E V A G A T A C Q C L T L D S V L  
AGCGGTGCCGCGCGCGGACCTCTCGGGTGTTGGGCGGTGCCACCGCCTAG  
TCCCCACGGCGGCGGCCTGGAGAGCCCAACCCGCCACGGTGGCGGATC  
R C H R R T S R V L G G A T A  
S G A T A G P L G C W A V P P P R  
A V P P P D L S G V G R C H R L  
ACTTTTTTCAGCTCACTGGTTGGATTCCAAACTTGACCCAAACCAGTCCGA  
TGAAAAAGTCGAGTGACCAACCTAAGGTTTGAACCTGGGTTTGGTCAGGCT  
T F S A H W L D S K L D P N Q S E  
L F Q L T G W I P N L T Q T S P  
D F F S S L V G F Q T . P K P V R  
ACTCGGGTCCAATTGACCCGTAACCGGATTATAGGATTAACCCTTAATCC  
TGAGCCCAGGTAACTGGGCATTGGCCTAATATCCTAATTGGGAATTAGG  
L G S N . P V T G L . D . P L I  
N S G S I D P . P D Y R I N P . S  
T R V Q L T R N R I I G L T L N P  
TAACCCTAATTATATGCAAACTACGCAACTGAAAATATAGTCCTAAGCAA  
ATTGGGATTAATATACGTTTGATGCGTTGACTTTTATATCAGGATTCGTT  
L T L I I C K L R N . K Y S P K Q  
P . L Y A N Y A T E N I V L S K  
N P N Y M Q T T Q L K I . S . A  
GTTTTTAACCGGCAAACGTCGAGTCTTCTTCCGGCGATCTTTTCGGCAGAC  
CAAAAATTGGCCGTTTGCAGCTCAGAAGAAGCCGCTGGAAAGCCGTCTG  
V F N R Q T S S L L P A I F R Q T  
F L T G K R R V F F R R S F G R  
S F . P A N V E S S S G D L S A D

FIG. 17B-2

TTCTGATATACCTTTGGATTTCTTCTAGCGGACTCCTAGTAGGGTCCCGA  
AAGACTATAAGGAAACCTAAAGAAGATCGCCTGAGGATCATCCCAGGGCT  
S D I P L D F F . R T P S R V P  
L L I Y L W I S S S G L L V G S R  
F . Y T F G F L L A D S . . G P D  
TCTTGTGGCGAGTTTAGCGAGTAGCCGAACCTTCTCGGTGATCTCCGCAA  
AGAACACCGCTCAAATCGCTCATCGGCTTGGAAGAGCCACTAGAGACGTT  
I L W R V . R V A E P S R . S P Q  
S C G E F S E . P N L L G D L R K  
L V A S L A S S R T F S V I S A  
ACCGCCGATGATCTCTTCGGCAGACTTTTCGAAACTTCGACAAGTCCCCG  
TGGCGGCTACTAGAGAAGCCGTCTGAAAGCTTTTGAAGCTGTTCAAGGGGC  
T A D D L F G R L S K T S T S P R  
P P M I S S A D F R K L R Q V P  
N R R . S L R Q T F E N F D K S P  
ATTTCTTCTCGGTTGGTTCCGACAGCATCTCTAACGAAACTTCGGACACC  
TAAAGAAGAGCCAACCAAGGCTGTCGTAGAGATTGCTTTGAAGCCTGTGG  
F L L G W F R Q H L . R N F G L  
D F F S V G S D S I S N E T S D S  
I S S R X V P T A S L T K L R T P  
TTGAATGTCCATCGAACTTGACTCCGGTAGGCTTGCTTTATATTTTCAGG  
AACTTACAGGTAGCTTGAACTGAGGCCATCCGAACGAAATATAAAAGTCC  
L E C P S N L T P V G L L Y I F R  
L N V H R T . L R . A C F I F S G  
. M S I E L D S G R L A L Y F Q  
CTATCATAGTTAATCCTACATACTTAACTCAATAATATGGATTAGATTAA  
GATAGTATCAATTAGGATGTATGAATTGAGTTATTATACCTAATCTAATT  
L S . L I L H T . L N N M D . I N  
Y H S . S Y I L N S I I W I R L  
A I I V N P T Y L T Q . Y G L D .

FIG. 17B-3

TTAACCCATCAATTGATTTTCATCATCAAAATTTCGACATTCAACAAACATC  
AATTGGGTAGTTAACTAAAGTAGTAGTTTTAAGCTGTAAGTTGTTTGTAG  
P I N F H H Q N S T F N K H  
I N P S I D F I I K I R H S T N I  
L T H Q L I S S S K F D I Q Q T S  
CGTACTCAATAACCCATCAGGCATAGTTACGTGACTATCTACTGTGATC  
GCATGAGTTATTGGGTAGTCCGATATCAATGCACTGATAGATGACACTAG  
P Y S I T H Q A I V T L S T V I  
R T Q P I R L L R D Y L L S  
V L N N P S G Y S Y V T I Y C D  
CGTACGTGAAGTTAGCGAGTCATGATCCAGGTCGTGTCACTTATTGGCCG  
GCATGCACTTCAATCGCTCAGTACTAGGTCCAGCACAGTGAATAACCGGC  
R T S R V M I Q V V S L I G R  
V R E V S E S S R S C H L L A  
P Y V K L A S H D P G R V T Y W P  
AACACGTATCCCTTATCCAAATCCAGTCTTCTCAACTCTTCTAGCCTACC  
TTGTACATAGGGAATAGGTTTAGGTCAGAAGAGTTGAGAAGATCGGATGG  
T R I P Y P N P V F S T L L A Y  
E H V S L I Q I Q S S Q L F P T  
N T Y P L S K S S L L N S S S L P  
EcoRI  
CGTCTCTTTTTTTTATTACTTTTGAAAGAATTCAAATCAAAACAGATACAA  
GCAGAGAAAAAAATAATGAAAACCTTTCTTAAGTTTAGTTTTGTCTATGTT  
P S L F L L L L K E F K S K Q I Q  
R L F F Y Y F K N S N Q N R Y K  
V S F F I T F E R I Q I K T D T  
AATAACACGGTGAGACACTGTGACATGCTAGTCTCTGGAAAGCATTAAATT  
TTATTGTGCCACTCTGTGACACTGTACGATCAGAGACCTTTCGTAATTAA  
N N T V R H C D M L V S G K H F  
I T R D T V T C S L E S I N  
K H G E T L H A S L W K A L I

FIG. 17C-1

CGCGCATCCACAGACGTCGTCAGCTTCATCACCCACTTTTTCTACATAA  
 GCGCGTAGGTGTCTGCAGCAGTCGAAGTAGTGGGTGAAAAAGGATGTATT  
 A H P Q T S S A S S P T F S Y I  
 S R I H R R R Q L H H P L F P T  
 R A S T D V V S F I T H F F L H N

CCATGTCGCATGGCTTTGTTGATGACAGACCACCACAAGCTTGCCTTTGG  
 GGTACAGCGTACCGAAACAACACTACTGTCTGGTGGTGTTCGAACGGAAACC  
 T M S H G F V D D R P P Q A C L W  
 P C R M A L L M T D H H K L A F G  
 H V A W L C . . Q T T T S L P L

TTGTGCCTAACAGAGAGAGAGACAGACCGATAGCCTCCTCATTCACTA  
 AACACGGATTGTCTCTCTCTCTCTGTCTGGCTATCGGAGGAGTAAGTGAT  
 L C L T E R E R Q T D S L L I H Y  
 C A . Q R E R D R P I A S S F T  
 V V P N R E R E T D R . P P H S L

TGGCGATCCGATCGCCAGCTTCGCTGCTGTTATTTGCGTTCCTGATGCTT  
 ACCGCTAGGCTAGCGGTGCGAAGCGACGACAATAAACGCAAGGACTACGAA  
 G D P I A S F A A V I C V P D A  
 M A I R S P A S L L L F A F L M L  
 W R S D R Q L R C C Y L R S . C L

GCGCTCACGGGAAGACTGCAGGCCCGGCGCAGCTCATGCATTGGCGTCTA  
 CGCGAGTGCCCTTCTGACGTCCGGGGCCGCGTCGAGTACGTAACCGCAGAT  
 C A H G K T A G P A Q L M H W R L  
 A L T G R L Q A R R S S C I G V Y  
 R S R E D C R P G A A H A L A S

CTGGGGACAAAACACCGACGAGGGAAGCTTAGCAGATGCTTGTGCCACAG  
 GACCCCTGTTTTGTGGCTGCTCCCTTCGAATCGTCTACGAACACGGTGTC  
 L G T K H R R G K L S R C L C H R  
 W G Q N T D E G S L A D A C A T  
 T G D K T P T R E A . Q M L V P Q

FIG. 17C-2



G C A A C T A C G A A T A C G T G A A C A T C G C C A C C C T T T T T C A A G T T T G G C A T G G G C  
C G T T G A T G C T T A T G C A C T T G T A G C G G T G G G A A A G T T C A A A C C G T A C C C G  
Q L R I R E H R H P F Q V W H G  
G N Y E Y V N I A T L F K F G M G  
A T T N T . T S P P F S S L A W A  
C A A A C T C C A G A G A T C A A C C T C G C C G G C C A C T G T G A C C C T C G G A A C A A C G G  
G T T T G A G G T C T C T A G T T G G A G C G G C C G G T G A C A C T G G G A G C C T T G T T G C C  
P N S R D Q P R R P L . P S E Q R  
Q T P E I N L A G H C D P R N N G  
D L Q R S T S P A T V T L G T T  
C T G C G C G C G C T T G A G C A G C G A A A T C C A G T C C T G C C A G G A G C G T G G C G T C A  
G A C G C G C G C G A A C T C G T C G C T T T A G G T C A G G A C G G T C C T C G C A C C G C A G T  
L R A L E Q R N P V L P G A W R Q  
C A R L S S E I Q S C Q E R G V  
A A R A . A A K S S P A R S V A S  
A G G T G A T G C T C T C C A T C G G A G G T G G C G G G T C T T A T G G C C T G A G T T C C A C C  
T C C A C T A C G A G A G G T A G C C T C C A C C G C C C A G A A T A C C G G A C T C A A G G T G G  
G D A L H R R W R V L W P E F H  
K V M L S I G G G G S Y G L S S T  
R . C S P S E V A G L M A . V P P

FIG. 17C-3

GAAGACGCCAAGGACGTAGCGTCATACCTCTGGCACAGTTTCTTGGGTGG  
CTTCTGCGGTTTCCTGCATCGCAGTATGGAGACCGTGTCAAAGAACCCACC  
R R R Q G R S V I P L A Q F L G W  
E D A K D V A S Y L W H S F L G G  
K T P R T . R H T S G T V S W V  
Xho I  
TTCTGCTGCTCGCTACTCGAGACCCCTCGGGGATGCGGTTCTGGATGGCA  
AAGACGACGAGCGATGAGCTGTGGGGAGCCCCTACGCCAAGACCTACCGT  
F C C S L L E T P R G C G S G W H  
S A A R Y S R P L G D A V L D G  
V L L L A T R D P S G M R F W M A  
TAGACTTCAACATCGCCGGAGGGAGCACAGAACACTATGATGAACTTGCC  
ATCTGAAGTTGTAGCGGCCTCCCTCGTGTCTTGTGATACTACTTGAACGG  
R L Q H R R E H R T L . . T C R  
I D F N I A G S T E H Y D E L A A  
. T S T S P E A Q N T M M N L P L  
GCTTTCCTCAAGGCCTACAACGAGCAGGAGGCCGGAACGAAGAAAGTTCA  
CGAAAGGAGTTCCGGATGTTGCTCGTCCTCCGGCCTTGCTTCTTTCAAGT  
F P Q G L Q R A G G R N E E E S S  
F L K A Y N E Q E A G T K K K V H  
S S R P T T S R R P E R R R K F  
CTTGAGTGCTCGTCCGCAGTGTCTTTCCCGGATTACTGGCTTGGCAACG  
GAACTCACGAGCAGGCGTACAGGAAAGGGCCTAATGACCGAACCGTTGC  
L E C S S A V S F P G L L A W Q R  
L S A R P Q C P F P D Y W L G N  
T . V L V R S V L S R I T G L A T  
Bgl II  
CACTCAGAACAGATCTCTTCGACTTCGTGTGGGTGCAGTTCTTCAACAAC  
GTGAGTCTTGTCTAGAGAAGCTGAAGCACACCCACGTCAAGAAGTTGTTG  
T Q N R S L R L R V G A V L Q Q  
A L R T D L F D F V W V Q F F N N  
H S E Q I S S T S C G C S S S T T

FIG. 17D-1

CCTTCGTGCCATTTCTCCCAGAACGCTATCAATCTTGCAAATGCGTTCAA  
GGAAGCACGGTAAAGAGGGTCTTGCGATAGTTAGAACGTTTACGCAAGTT  
P F V P F L P E R Y Q S C K C V Q  
P S C H F S Q N A I N L A N A F N  
L R A I S P R T L S I L Q M R S  
CAATTGGGTCATGTCCATCCCTGCGCAAAAGCTGTTTCCTTGGGCTTCCTG  
GTTAACCCAGTACAGGTAGGGACGCGTTTTTCGACAAGGAACCCGAAGGAC  
Q L G H V H P C A K A V P W A S C  
N W V M S I P A Q K L F L G L P  
T I G S C P S L R K S C S L G F L  
CTGCTCCTGAGGCTGCTCCAACCTGGTGGCTACATTCCACCCCATGATCTC  
GACGAGGACTCCGACGAGGTTGACCACCGATGTAAGGTGGGGTACTAGAG  
C S . G C S N W W L H S T P . S  
A A P E A A P T G G Y I P P H D L  
L L L R L L Q L V A T F H P M I S  
ATATCTAAAGTTCTTCCGATCCTAAAGGATTCCGACAAGTACGCAGGAAT  
TATAGATTTCAAGAAGGCTAGGATTTCTTAAGGCTGTTTCATGCGTCCTTA  
H I . S S S D P K G F R Q V R R N  
I S K V L P I L K D S D K Y A G I  
Y L K F F R S . R I P T S T Q E  
CATGCTGTGGACTAGATACACGACAGAACTCCGGCTACAGTTCTCAAG  
GTACGACACCTGATCTATGGTGTCTGCTTTGAGGCCGATGTCAAGAGTTC  
H A V D . I P R Q K L R L Q F S S  
M L W T R Y H D R N S G Y S S Q  
S C C G L D T T T E T P A T V L K  
TCAAGTCCCACGTGTGTCCAGCGCGTCTGTTCTCCAACATCTTATCTATG  
AGTTCAGGGTGCACACAGGTCGCGCAGCCAAGAGTTGTAGAATAGATAC  
Q V P R V S S A S V L Q H L I Y  
V K S H V C P A R R F S N I L S M  
S S P T C V Q R V G S P T S Y L C

FIG. 17D-2

CCGGTGAAGTCTTCCAAGTAAACCTGAACGGCGTAGATGATCGGTGGTCG  
GGCCACTTCAGAAGGTTTCATTTGGACTTGCCGCATCTACTAGCCACCAGC  
A G E V F Q V N L N G V D D R W S  
P V K S S K . T . T A . M I G G R  
R . S L P S K P E R R R . S V V  
AAAACTCCGATCATCATGGGTCCCCATCCGTATCCGTGCGTTGCTACGTT  
TTTTGAGGCTAGTAGTACCCAGGGGTAGGCATAGGCACGCAACGATGCAA  
K T P I I M G P H P Y P C V A T L  
K L R S S W V P I R I R A L L R  
E N S D H H G S P S V S V R C Y V  
ATGGTGTTCCTTGTATGTTGGTCTTTTCAATAATATAATAAGGGGTTA  
TACCACAAAGGGAACATACAACCAGAAAAGTTATTATATTATTCCCCAAT  
W C F P C M L V F S I I . G V  
Y G V S L V C W S F Q . Y N K G L  
M V F P L Y V G L F N N I I R G .  
GTTTTACGTTTCCATATTTTCCATGTTGAAAACAGTATATTTGCTGCCC  
CAAAATGCAAAGGTATAAAAGGTACAAGCTTTTGTTCATATAAACGACGGG  
S F T F P Y F P C S K T V Y L L P  
V L R F H I F H V R K Q Y I C C P  
F Y V S I F S M F E N S I F A A

FIG. 17D-3

1033394 3236360

CTTCCAAATTTGAAAAAGATAAAATAAATATATAACTAAAAATATCCTCT  
GAAGGTTTAAACTTTTTCTATTTTATTTATATATTGATTTTATAGGAGA  
L P N L K K I K . I Y N . K Y P L  
F Q I . K R . N K Y I T K N I L  
P S K F E K D K I N I . L K I S S  
TTTTTTTTTCTTTCGACAAATATATAACTCTTAACTTTCCCAATTGTTTA  
AAAAAAAAAAGAAAGCTGTTTATATATTGAGAATTGAAGGGGTTAACAAAT  
F F F F R Q I Y N S . L S Q L F  
F F F S F D K Y I T L N F P N C L  
F F F L S T N I . L L T F P I V .  
AGCAAAAGATATAAATCCTCTTCCACACAAAAGACGAATCCATGATTGCT  
TCGTTTTCTATATTTAGGAGAAGGTGTGTTTTCTGCTTAGGTACTAACGA  
K Q K I . I L F H T K D E S M I A  
S K R Y K S S S T Q K T N P . L L  
A K D I N P L P H K R R I H D C  
GGATTGCTGTCTACTGGTGCCGAAATGGCGACGAGAGAAGCTTGTGCTAC  
CCTAACGACAGATGACCACGGCTTTACCGCTGCTCTCTTCGAACACGATG  
G L L S T G A E M A T R E A C A T  
D C C L L V P K W R R E K L V L  
W I A V Y W C R N G D E R S L C Y  
CTGCAATTACAAGTTCGTCAACATTGTCTTCCTTGCCATGTTTGGTGACG  
GACGTTAATGTTCAAGCAGTTGTAACAGAAGGAACGGTACAAACCACTGC  
C N Y K F V N I V F L A M F G D  
P A I T S S S T L S S L P C L V T  
L Q L Q V R Q H C L P C H V W . R  
CCATACTCCCGTGATCAGGACACACCTCTGGAACAGTTTCTTGGGAAGTT  
GGTATGAGGGCACTAGTCCTGTGTGGAGACCTTGTCAAAGAACCCTTCAA  
A I L P . S G H T S G T V S W E V  
P Y S R D Q D T P L E Q F L G K L  
H T P V I R T H L W N S F L G S

FIG. 17E-1

AATCTTCTTCTCGGCTCCTCGGCGACCAATCTTGTGAGGTTCTTCTCCTG  
TTAGAAGAAGAGCCGAGGAGCCGCTGGTTAGAACACTCCAAGAAGAGGAC  
N L L L G S S A T N L V R F F S .  
I F F S A P R R P I L . G S S P  
. S S S R L L G D Q S C E V L L L  
AATGGTGTCCACTTCGACATCGAAGGTCTACCTGAGCGCANATCCACAGT  
TTACCACAGATGAAGCTGTAGCTTCCAGATGGACTCGCGTNTAGGTGTCA  
M V S T S T S K V Y L S A ? P Q  
E W C P L R H R R S T . A ? I H S  
N G V H F D I E G L P E R ? S T V  
TCCGACTACGTGTGGGTGCAGTTCTACTACACAGGCAACTCGCAGATGCC  
AGGCTGATGCACACCCACGTCAAGATGATGTGTCCGTTGAGCGTCTACGG  
F R L R V G A V L L H R Q L A D A  
S D Y V W V Q F Y Y T G N S Q M P  
P T T C G C S S T T Q A T R R C  
CGGTAACAATGGGTTTCTCCATCCTGCATGGAAGGTGTTCCCTGGACTTCC  
GCCATTGTTACCCAAGAGGTAGGACGTACCTTCCACAAGGGACCTGAAGG  
R . Q W V L H P A W K V F P G L P  
G N N G F S I L H G R C S L D F  
P V T M G S P S C M E G V P W T S  
TGCTGCTCCTCAGGCTGCTGGAAGGAGCTCCATTCCACTAGTGATCTTAC  
ACGACGAGGAGTCCGACGACCTTCTCGAGGTAAGGTGATCACTAGAATG  
A A P Q A A G R S S I P L V I L  
L L L L R L L E G A P F H . S Y  
C C S S G C W K E L H S T S D L T  
ACGTGTCTTATCATCAAGAATTATAGCAAGTACCGAGGGATTATTAAAT  
TGCACAGAATAGTAGTTCTTAATATCGTTTCATGGCTCCCTAATAATTTTA  
H V S Y H Q E L . Q V P R D Y . N  
T C L I I K N Y S K Y R G I I K I  
R V L S S R I I A S T E G L L K

Sac I Spe I

FIG. 17E-2

AAAAAAAAAGGGAAGAATGGGAATTAGAATTAAAACTGAAACCGGCCATG  
TTTTTTTTTCCCTTCTTACCCTTAATCTTAATTTTGACTTTGGCCGGTAC  
K K K G K N G N . N . N . N R P .  
K K K G R M G I R I K T E T G H  
K K K R E E W E L E L K L K P A M  
AAGAACGTTTTTCGAGTGAAGACAACGACAGTATGAGACGGTAGTTTGCTA  
TTCTTGCAAAAGCTCACTTCTGTTGCTGTCATACTCTGCCATCAAACGAT  
R T F R V K T N D S M R R . F A  
E E R F E . R Q T T V . D G S L L  
K N V S S E D K R Q Y E T V V C Y  
TGGACATGGATCGTTCCCAAAGCAGTCCAAGTCTTTATGAACCGGTCTAT  
ACCTGTACCTAGCAAGGGTTTCGTCAGGTTCAGAAATACTTGGCCAGATA  
M D M D R S Q S S P S L Y E P V Y  
W T W I V P K A V Q V F M N R S I  
G H G S F P K Q S K S L . T G L  
CGGTTCAGCCTTCAAGAACCGCGAGGATAACCGGCCCAAGAGAAACAACA  
GCCAAGTCGGAAGTTCTTGGCGCTCCTATTGGCCGGGTTCTCTTTGTTGT  
R F S L Q E P R G . P A Q E K Q Q  
G S A F K N R E D N R P K R N N  
S V Q P S R T A R I T G P R E T T

FIG. 17E-3

AATTGTGGTGAGCTTTTANTATAAACCGAACGGTGCCGTCCGTCAGATGT  
TTAACACCACTCGAAAATNATATTTGGCTTGCCACGGCAGGCAGTCTACA  
I V V S F ? Y K P N G A V R Q M  
K L W . A F ? I N R T V P S V R C  
N C G E L L ? . T E R C R P S D V

Bgl II

TAAATGGACGGCGGATAGATCTCCAGAGTAAATCTGAGGAAAATCGTTCC  
ATTTACCTGCCGCCTATCTAGAGGTCTCATTTAGACTCCTTTTAGCAAGG  
L N G R R I D L Q S K S E E N R S  
. M D G G . I S R V N L R K I V P  
K W T A D R S P E . I . G K S F

GGCCCCCTACCACGACCCACGCGATCCGTCCTCTCCCCACCCCCTACA  
CCGGGGGGGATGGTGCTGGGTGCGCTAGGCAGGAGAGGGGGTGGGGGATGT  
G P P T T T H A I R P L P H P L H  
A P L P R P T R S V L S P T P Y  
R P P Y H D P R D P S S P P P P T

EcoRI

CCTTTTTCTTCTTCGCTCCTGCGATCGGTTATTTGATTTTGTGTATGAT  
GGAAAAAGAAGAAGGCGAGGACGCTAGCCAATAAACTAAAACACATACTA  
L F L L P L L R S V I . F C V .  
T F F F F R S C D R L F D F V Y D  
P F S S S A P A I G Y L I L C M I

ATCCAATTTCTTTTCTGGAGTGGTATCCTATTCTAATTTCTTAGATTGTT  
TAGGTTAAAGAAAAGACCTCACCATAGGATAAGATTAAAGAATCTAACAA  
Y P I S F L E W Y P I L I S . I V  
I Q F L F W S G I L F . F L R L L  
S N F F S G V V S Y S N F L D C

GTATTGAACCATCAGTTTTGGTTTTAAGCGCATGATGGCGGAGAGTTTCGG  
CCTAACTTGGTAGTCAAAACCAAATTCGCGTACTACCGCCTCTCAAAGCC  
V L N H Q F W F K R M M A E S F G  
Y . T I S F G L S A . W R R V S  
C I E P S V L V . A H D G G E F R

FIG. 17F-1



AATCTTCTTCTCGGCTCCTCGGCGACCAATCTTGTGAGGTTCTTCTCCTG  
TTAGAAGAAGAGCCGAGGAGCCGCTGGTTAGAACACTCCAAGAAGAGGAC  
N L L L G S S A T N L V R F F S  
I F F S A P R R P I L G S S P  
S S S R L L G D Q S C E V L L L  
AATGGTGTCCACTTCGACATCGAAGGTCTACCTGAGCGCANATCCACAGT  
TTACCACAGATGAAGCTGTAGCTTCCAGATGGACTCGCGTNTAGGTGTCA  
M V S T S T S K V Y L S A ? P Q  
E W C P L R H R R S T A ? I H S  
N G V H F D I E G L P E R ? S T V  
TCCGACTACGTGTGGGTGCAGTTCTACTACACAGGCAACTCGCAGATGCC  
AGGCTGATGCACACCCACGTCAAGATGATGTGTCCGTTGAGCGTCTACGG  
F R L R V G A V L L H R Q L A D A  
S D Y V W V Q F Y Y T G N S Q M P  
P T T C G C S S T T Q A T R R C  
CGGTAACAATGGGTTTCTCCATCCTGCATGGAAGGTGTTCCCTGGACTTCC  
GCCATTGTTACCCAAGAGGTAGGACGTACCTTCCACAAGGGACCTGAAGG  
R Q W V L H P A W K V F P G L P  
G N N G F S I L H G R C S L D F  
P V T M G S P S C M E G V P W T S  
TGCTGCTCCTCAGGCTGCTGGAAGGAGCTCCATTCCACTAGTGATCTTAC  
ACGACGAGGAGTCCGACGACCTTCTCGAGGTAAGGTGATCACTAGAATG  
A A P Q A A G R S S I P L V I L  
L L L L R L L E G A P F H S Y  
C C S S G C W K E L H S T S D L T  
ACGTGTCTTATCATCAAGAATTATAGCAAGTACCGAGGGATTATTAAAT  
TGCACAGAATAGTAGTTCTTAATATCGTTTCATGGCTCCCTAATAATTTTA  
H V S Y H Q E L Q V P R D Y N  
T C L I I K N Y S K Y R G I I K I  
R V L S S R I I A S T E G L L K

FIG. 17E-2

CTCTCCCGACCATTAGGATGAGGGTTGAAGGTGAAAATACTTTCTGGTAA  
 GAGAGGGCTGGTAATCCTACTCCCAACTTCCACTTTTATGAAAGACCAT  
 S P D H . D E G . R . K Y F L V  
 A L P T I R M R V E G E N T F W .  
 L S R P L G . G L K V K I L S G N  
 TTTTCCTCTCTAAATTCTTCCAAACACGACACAAGTATAATTATAGACCA  
 AAAAGGAGAGATTTAAGAAGGTTTGTGCTGTGTTTCATATTAATATCTGGT  
 I F L S K F F Q T R H K Y N Y R P  
 F S S L N S S K H D T S I I I D Q  
 F P L . I L P N T T Q V . L . T  
 AGATTGATTCTTCTTATGCACCGATTCTCACTTCCCTTCCCTCTGTGTTA  
 TCTAACTAAGAAGAATACGTGGCTAAGAGTGAAGGGAAGGGAGACACAAT  
 R L I L L M H R F S L P F P L C Y  
 D . F F L C T D S H F P S L C V  
 K I D S S Y A P I L T S L P S V L  
 TGGTTATCGTTGTTACTGATGGTTGCTTAACTCATGGGGTAGCGCCTGGG  
 ACCAATAGCAACAATGACTACCAACGAATTGAGTACCCCATCGCGGACCC  
 G Y R C Y . W L L N S W G S A W  
 M V I V V T D G C L T H G V A P G  
 W L S L L L M V A . L M G . R L G

FIG. 17F-3

Pst I Sal I  
 TGATCCGTTGACCTGCAGGTCGAC  
 ACTAGGCAACTGGACGTCCAGCTG → 4924  
 V I R . P A G R  
 . S V D L Q V D  
 D P L T C R S T

FIG. 17G-1

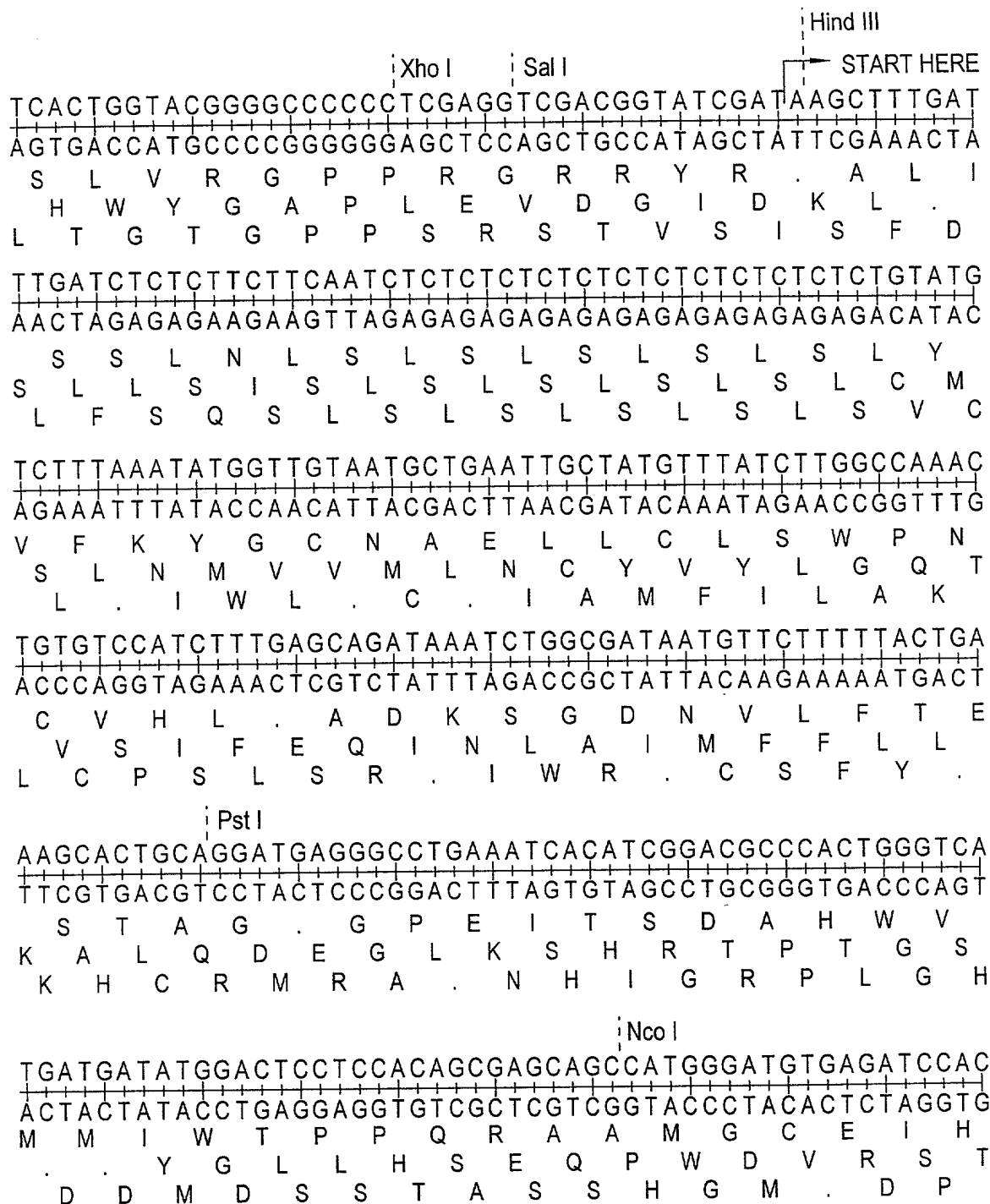


FIG. 18A-1

ATAGCAGCGTAGATAAGGGAAGCCCGCAACACTAGGCTGTTGTTGTTCCA  
TATCGTCGCATCTATTCCCTTCGGGCGTTGTGATCCGACAACAACAAGGT  
I A A . I R E A R N T R L L L F Q  
Q R R . G K P A T L G C C C S  
H S S V D K G S P Q H . A V V V P  
GTAAAGATCGAAAGGTCAGGCGACAGTGACGATCGACTTTTTTCGAGCATG  
CATTTCTAGCTTTCCAGTCCGCTGTCACTGCTAGCTGAAAAAGCTCGTAC  
R S K G Q A T V T I D F F E H  
S K D R K V R R Q . R S T F S S M  
V K I E R S G D S D D R L F R A .  
ATGACAACGACGACCTGCTCCTGCAATATCCGTCCCCTACCGTAGAGTGG  
TACTGTTGCTGCTGGACGAGGACGTTATAGGCAGGGGATGGCATCTCACC  
D D N D D L L L Q Y P S P T V E W  
M T T T T C S C N I R P L P . S G  
Q R R P A P A I S V P Y R R V  
GAATAAATGGGTTTGTAGTTGCACTATTTCTCGCAGGAATTAATTGAAAG  
CTTATTTACCCAAACATCAACGTGATAAAGAGCGTCCTTAATTAACTTTC  
E . M G L . L H Y F S Q E L I E S  
N K W V C S C T I S R R N . L K  
G I N G F V V A L F L A G I N . K  
CCCTGCAAATTGCTGTTTCTCTTTCCTTATATTAAACCTTCCTCCTGTTA  
GGGACGTTTAAACGACAAAGAGAAAGGAATATAATTTGGAAGGAGGACAAT  
P A N C C F S F L I L N L P P V  
A L Q I A V S L S L Y . T F L L L  
P C K L L F L F P Y I K P S S C Y  
CATTAAAATTGCATGTTAAGACATTTCTGTATGGATCCGAACATGAGATC  
GTAATTTTAAACGTACAATTCTGTAAAGACATACCTAGGCTTGTACTCTAG  
T L K L H V K T F L Y G S E H E I  
H . N C M L R H F C M D P N M R S  
I K I A C . D I S V W I R T . D

BamH I

Bgl II

FIG. 18A-2

TATCATTGAAGTAATGGGTAGGATTTACATTATCATCATCATCATCT  
ATAGTAACTTCATTACCCATCCTAAATGTAATAGTAGTAGTAGTAGA  
Y H . S N G . D L H Y H H H H L  
I I E V M G R I Y I I I I I I  
L S L K . W V G F T L S S S S S S

Nco I

CCATGGGTTTGGATCTAATTAGACCGAAAACCTCATTTAAAATCCAACCC  
GGTACCCAAACCTAGATTAATCTGGCTTTTGGAGTAAATTTTAGGTTGGG  
H G F G S N . T E N L I . N P T  
S M G L D L I R P K T S F K I Q P  
P W V W I . L D R K P H L K S N P  
CAATATTGGCTTGACTTGCTCCATCTCCAAGAAAAATACAACAAGAACAA  
GTTATAACCGAACTGAACGAGGTAGAGGTTCTTTTTATGTTGTTCTTGT  
P I L A . L A P S P R K I Q Q E Q  
Q Y W L D L L H L Q E K Y N K N N  
N I G L T C S I S K K N T T R T  
CAAAAATTTAGGATGCACATTGAATTGATTTGGTCACTATGAGAGAATCA  
GTTTTTAAATCCTACGTGTAACCTTAACTAAACCAAGTGATACTCTCTTAGT  
Q K F R M H I E L I W S L . E N H  
K N L G C T L N . F G H Y E R I  
T K I . D A H . I D L V T M R E S

FIG. 18A-3

TGGATTAAAAATATTAAAAATAAAAAATAAATCATAATCATCTACTCACTC  
ACCTAATTTTTTATAATTTTTATTTTTTATTTAGTATTAGTAGATGAGTGAG  
G L K I L K . K I N H N H L L T  
M D . K Y . N K K . I I I I Y S L  
W I K N I K I K N K S . S S T H S  
TAACGATTACATTCTATCCACCAAATTTGACATCGGCTTCTAATTAATT  
ATTGCTAAGTGTAAGATAGGTGGTTTAAACTGTAGCCGAAGATTAATTAA  
L T I H I L S T K F D I G F . L I  
. R F T F Y P P N L T S A S N . F  
N D S H S I H Q I . H R L L I N  
TCATATATTAGGTTCTAAAAAATCTCTCCCTTTGACAGATGAATAAATAT  
TGTTTTTTTTCTTGTTTTTTTTGTGTGGGTTTCTGTCTTCTTTTTTTTTT  
S Y I R F . K I S P F D R . I N I  
H I L G S K K S L P L T D E . I  
F I Y . V L K N L S L . Q M N K Y  
TTCTTTTAATTCGTTAGGGAAGGATCTAATATAATATATATATATATA  
AAGAAAATTAAGCAATCCCTTCCTAGATTATATTATATATATATATAT  
S F N S L G K D L I . Y I Y I Y  
F L L I R . G R I . Y N I Y I Y I  
F F . F V R E G S N I I Y I Y I Y  
TATTTATTTATTAGATTCTAACCATTCTCTCACAAGAATATGAATCGAC  
ATAAATAAATAATCTAAGATTGGTAAAGAGAGTGTTCTTATACTTAGCTG  
I F I Y . I L T I S L T R I . I D  
Y L F I R F . P F L S Q E Y E S T  
I Y L L D S N H F S H P N M N R  
SEQA →  
GGCCATATCTGCAAAAACCCACCAATTGTTTACAGTAAACGCTCATTGAA  
CCGGTATAGACGTTTTTGGGTGGTTAACAAAGTGTCATTTGCGAGTAACCTT  
G H I C K N P P I V H S K R S L N  
A I S A K T H Q L F T V N A H .  
R P Y L Q K P T N C S Q . T L I E

FIG. 18B-1

TTAAGGTCGAAATTACTTTTTAAATTTCTAGAGATTTCCAATAAAATATAC  
AATTCCAGCTTTAATGAAAATTTAAAGATCTCTAAAGGTTATTTTATATG  
G R N Y F I S R D F Q N I  
I K V E I T F K F L E I S N K I Y  
L R S K L L L N F R F P I K Y T  
TCGTATCTTTTACAGTGATGATGCTCCGGATGATAAGATGGAAGGATGCG  
AGCATAGAAAATGTCACTACTACGAGGCCTACTATTCTACCTTCCTACGC  
L V S F T V M M L R M I R W K D A  
S Y L L Q C S G D G R M R  
R I F Y S D D A P D D K M E G C  
TGTGTCAGCCGCCTGCGATCTCTGTGGCGGGGACGAGACGAAGACAAGGA  
ACACAGTCGGCGGACGCTAGAGACACCGCCCCTGCTCTGCTTCTGTTTCCT  
C V S R L R S L W R G R D E D K D  
V S A A C D L C G G D E T K T R  
C C Q P P A I S V A G T R R R Q G  
CGTGAGCGGACGATACCAAGTCTTCTCCTCCCCCACCACGCACGTCTCAG  
GAACTCGCCTGCTATGGTTCAGAAGAGGAGGGGGTGGTGCCTGCAGAGTC  
V S G R Y Q V F S S P T T H V S  
T A D D T K S S P P P P R T S Q  
R E R T I P S L L L P H H A R L R  
ATTCCTCGATACGGCCTATCCCGGTGGCGTGTGGACTGCACAGACGAACGA  
TAAGGGCTATGCCGGATAGGGCCACCGCACACCTGACGTGTCTGCTTGCT  
D S R Y G L S R W R V D C T D E R  
I P D T A Y P G G V W T A Q T N E  
F P I R P I P V A C G L H R R T  
GTAAATGCCCATCCCCCTCTTTCATTCTTTCTTTTGGCGTGTGTGAGAG  
CATTACGGGTAGGGGGGAGAAAGTAAGAAAGAGAAACGCACACACTCTC  
V N A H P P S F I L S L C V C E R  
M P I P P L S F F L F A C V R  
S K C P S P L F H S F S L R V E

FIG. 18B-2

GAGCGCCTATAAATAAGCACGAAACAAGCCCCTTTTCTCTCCAAGAACAC  
CTCGCGGATATTTATTTCGTGCTTTGTTTCGGGAAAAGAGAGGTTCTTG TG  
S A Y K . A R N K P L F S P R T  
G A P I N K H E T S P F S L Q E H  
E R L . I S T K Q A P F L S K N T  
ACCACACCATTACACACTACATCCTCTGCTTCTTCGAGCCTTTTTCGCCT  
TGGTGTGGTAAGTGTGTGATGTAGGAGACGAAGAAGCTCGGAAAAGCGGA  
H H T I H T L H P L L L R A F S P  
T T P F T H Y I L C F F E P F R L  
P H H S H T T S S A S S S L F A  
| Sal I  
TCCTTCCTCGTCTAACCATGTTCGACCTGCGGCAACTGCGACTGCGTTGAC  
AGGAAGGAGCAGATTGGTACAGCTGGACGCCGTTGACGCTGACGCAACTG  
S F L V . P C R P A A T A T A L T  
P S S S N H V D L R Q L R L R .  
F L P R L T M S T C G N C D C V D  
AAGAGCCAGTGCGTGTAAGTCATCCTCCATCCCTCCACCTCTTCTTCTTC  
TTCTCGGTCACGCACATTCAGTAGGAGGTAGGGAGGTGGAGAAGAAGAAG  
R A S A C K S S S I P P P L L L  
Q E P V R V S H P P S L H L F F F  
K S Q C V . V I L H P S T S S S S

FIG. 18B-3



Sal I  
TTCTTCTTCTTCTTCTTCTAACCTCGCCCCGTTTGTGTTTGATGAGTCGA  
AAGAAGAAGAAGAAGAAGATTGGAGCGGGGCAAACACAACTACTCAGCT  
L L L L L L L T S P R L C L M S R  
F F F F F F F . P R P V C V . V D  
S S S S S S S N L A P F V F D E S

SEQ B →  
ACTCTTCCCACATCGCTCGTCAAACTCAGAGCTTTATTAGGGAACCTCAG  
TGAGAAGGGTGTAGCGAGCAGTTTTGAGTCTCGAAATAATCCCTTGAGTC  
L F P H R S S K L R A L L G N I S  
S S H I A R Q N S E L Y . G T S  
T L P T S L V K T Q S F I R E H Q

CAATACTATATGTATATGTANAAGGTCAACGTTGGCTGAAGAACTTGGTT  
GTTATGATATACATATACATNTTCCAGTTGCAACCGACTTCTTGAACCAA  
N T I C I C ? R S T L A E E L G  
A I L Y V Y V ? G Q R W L K N L V  
Q Y Y M Y M ? K V N V G . R T W F

TTGCCTTTGCAGGAAGAAAGGAAACAGCTACGGTATCGATATTGTTGAGA  
AACGGAAACGTCCTTCTTTCCTTTGTCGATGCCATAGCTATAACAACCTCT  
F A F A G R K E T A T V S I L L R  
L P L Q E E R K Q L R Y R Y C . D  
C L C R K K G N S Y G I D I V E

CCGAGAAGAGGTACTGATTAGCTTCTTCTCCCTCCTCCTCGTTCGAGGATG  
GGCTCTTCTCCATGACTAATCGAAGAAGAGGGAGGAGGAGCAGCTCCTAC  
P R R G T D . L L L P P P R R G .  
R E E V L I S F F S L L L V E D  
T E K R Y . L A S S P S S S S R M

ATCAAATAATTAGGATTACACCTTATTACCTTACCTAATGCTTTTTCCG  
TAGTTTGATTAATCCTAATGTGGAATAATGGAATGGATTACGAAAAAGGC  
S N . L G L H L I T L P N A F S  
D Q T N . D Y T L L P Y L M L F P  
I K L I R I T P Y Y L T . C F F R

FIG. 18C-1

GTAAGATGGGATAACGCAGTATCATCTGTGTTATCTCTGTCCTGTGTTAC  
 CATTCTACCTATTGCGTCATAGTAGACACAATAGAGACAGGACACAATG  
 C K M G R S I I C V I S V L C Y  
 V R W D N A V S S V L S L S C V T

AACTCTCCTATCTATCCTAGTCAATGAAATATTATTAGTATTAATCTGGT  
TTGAGAGGATAGATAGGATCAGTTACTTTATAATAATCATAATTAGACCA  
Q L S Y L S . S M K Y Y . Y . S G  
N S P I Y P S Q . N I I S I N L V  
T L L S I L V N E I L L V L L W  
TGTGTCATTTCATATATGCTGCTGCTGCTGCTTTCCTCTTTACCAATC  
ACACAGTAAGTATATACGACGACGACGACGACGAAGGAGAAAGTGGTTAG  
C V I H I C C C C C C F L F H Q S  
V S F I Y A A A A A A S S F T N  
L C H S Y M L L L L L L P L S P I  
AACCCAAAGGATCGATTGCACTGTAAGGCCCAACTTCCTCACCGATATGC  
TTGGGTTTCCTAGCTAACGTGACATTCCGGGTTGAAGGAGTGGCTATACG  
T Q R I D C T V R P N F L T D M  
Q P K G S I A L . G P T S S P I C  
N P K D R L H C K A Q L P H R Y A  
← SEQ D  
TCGCTCAGTTACGATGAATGAACAGCAACCAAACGAGTCTGC  
AGCGAGTCAATGCTACTTACTTGTCTGTTGGTTTGCTCAGACG → 2392  
L A Q L R . M N S N Q T S L  
S L S Y D E . T A T K R V C  
R S V T M N E Q Q P N E S A

FIG. 18C-3

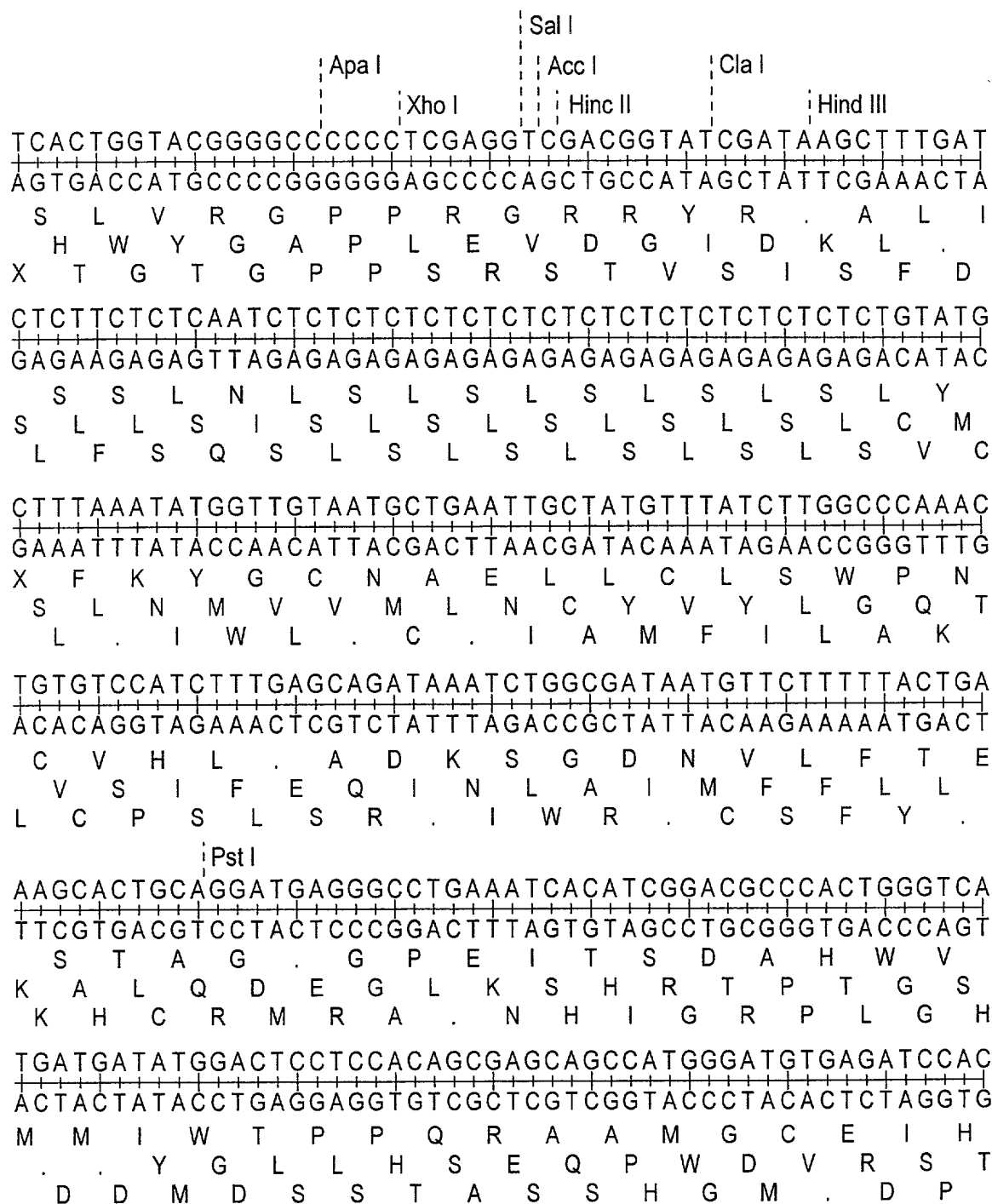


FIG. 19A-1

ATAGCAGCGTAGATAAGGGAAGCCCGCAACACTAGGCTGTTGTTGTTCCA  
TATCGTCGCATCTATTCCCTTCGGGCGTTGTGATCCGACAACAACAAGGT  
X A A . I R E A R N T R L L L F Q  
. Q R R . G K P A T L G C C C S  
H S S V D K G S P Q H . A V V V P  
GTAAAGATCGAAAGGTCAGGCGACAGTGACGATCGACTTTTTTCGAGCATG  
CATTTCTAGCTTTCCAGTCCGCTGTCACTGCTAGCTGAAAAAGCTCGTAC  
. R S K G Q A T V T I D F F E H  
S K D R K V R R Q . R S T F S S M  
V K I E R S G D S D D R L F R A .  
ATGACAACGACGACCTGCTCCTGCAATATCCGTCCCCTACCGTAGAGTGG  
TACTGTTGCTGCTGGACGAGGACGTTATAGGCAGGGGATGGCATCTCACC  
D D N D D L L L Q Y P S P T V E W  
M T T T T C S C N I R P L P . S G  
. Q R R P A P A I S V P Y R R V  
GAATAAATGGGTTTGTAGTTGCACTATTTCTCGCAGGAATTAATTGAAAG  
CTAATTTACCCAAACATCAACGTGATAAAGAGCGTCCTTAATTAACTTTC  
E . M G L . L H Y F S Q E L I E S  
N K W V C S C T I S R R N . L K  
G I N G F V V A L F L A G I N . K

FIG. 19A-2

CCCTGCAAATTGCTGTTTCTCTTTCCTTATATTAAACCTTCCTCCTGTTA  
GGGACGTTTAAACGACAAAGAGAAAGGAATATAATTTGGAAGGAGGACAAT  
P A N C C F S F L I L N L P P V  
A L Q I A V S L S L Y . T F L L L  
P C K L L F L F P Y I K P S S C Y

| BamH I

CATTAAAATTGCATGTTAAGACATTTCTGTATGGATCCGAACATGAGATC  
GTAATTTTAAACGTACAATTCTGTAAAGACATACCTAGGCTTGTACTCTAG  
T L K L H V K T F L Y G S E H E I  
H . N C M L R H F C M D P N M R S  
I K I A C . D I S V W I R T . D

TATCATTGAAGTAATGGGTAGGATTTACATTATCATCATCATCATCT  
ATAGTAACTTCATTACCCATCCTAAATGTAATAGTAGTAGTAGTAGA  
Y H . S N G . D L H Y H H H H L  
I I E V M G R I Y I I I I I I  
L S L K . W V G F T L S S S S S S

| BstX I

CCATGGGTTTTGATCTAATTAGACCGAAAACCTCATTTAAAATCCAACCC  
GGTACCCAAACCTAGATTAAATCTGGCTTTTGGAGTAAATTTTAGGTTGGG  
H G F G S N . T E N L I . N P T  
S M G L D L I R P K T S F K I Q P  
P W V W I . L D R K P H L K S N P

FIG. 19A-3

XXATATTGGCTTGACTTGCTCCATCTCCAAGAAAAATACAACAAGAACAA  
|-----|  
XXTATAACCGAACTGAACGAGGTAGAGGTTCTTTTATGTTGTTCTTGTT  
|-----|  
X I L A . L A P S P R K I Q Q E Q  
X Y W L D L L H L Q E K Y N K N N  
N I G L T C S I S K K N T T R T  
CAAAAATTTAGGATGCACATTGAATTGATTTGGTCACTATGAGAGAATCA  
|-----|  
GTTTTTAAATCCTACGTGTAACCTTAACTAAACCAGTGATACTCTCTTAGT  
|-----|  
Q K F R M H I E L I W S L . E N H  
K N L G C T L N . F G H Y E R I  
T K I . D A H . I D L V T M R E S  
TGGATTAAAAATATTAAAAATAAAAAATAAATCATAATCATCTACTCACTC  
|-----|  
ACCTAATTTTTTATAATTTTATTTTTTATTTAGTATTAGTAGATGAGTGAG  
|-----|  
G L K I L K . K I N H N H L L T  
. D . K Y . N K K . I I I I Y S L  
W I K N I K I K N K S . S S T H S  
TAACGATTCACATTCTATCCACCAAATTTGACATCGGCTTCTAATTAATT  
|-----|  
ATTGCTAAGTGTAAGATAGGTGGTTTAACTGTAGCCGAAGATTAATTAA  
|-----|  
L T I H I L S T K F D I G F . L I  
. R F T F Y P P N L T S A S N . F  
N D S H S I H Q I . H R L L I N  
TCATATATTAGGTTCTAAAAAATCTCTCCCTTTGACAGATGAATAAATAT  
|-----|  
AGTATATAATCCAAGATTTTTTATAGAGAGGGAAACTGTCTACTTATTTATA  
|-----|  
S Y I R F . K I S P F D R . I N I  
H I L G S K K S L P L T D E . I  
F I Y . V L K N L S L . Q M N K Y  
TTCTTTTAATTCGTTAGGGAAGGATCTAATATAATATATATATATATA  
|-----|  
AAGAAAATTAAGCAATCCCTTCCTAGATTATATTATATATATATATATAT  
|-----|  
S F N S L G K D L I . Y I Y I Y  
F L L I R . G R I . Y N I Y I Y I  
F F . F V R E G S N I I Y I Y I Y

FIG. 19B-1

**FIG. 19B-2**



ATTCCCGATACGGCCTATCCCGGTGGCGTGTGGACTGCACAGACGAACGA  
TAAGGGCTATGCCGGATAGGGCCACCGCACACCTGACGTGTCTGCTTGCT  
D S R Y G L S R W R V D C T D E R  
I P D T A Y P G G V W T A Q T N E  
F P I R P I P V A C G L H R R T  
GTAAATGCCCATCCCCCTCTTTCACTTTCTCTTTGCGTGTGTGAGAG  
CATTTACGGGTAGGGGGGAGAAAGTAAGAAAGAGAAACGAACACACTCTC  
V N A H P P S F I L S L C V C E R  
S M P I P P L S F F L F A C V R  
S K C P S P L F H S F S L R V E  
GAGCGCCTATAAATAAGCACGAAACAAGCCCCTTTTCTCTCCAAGAACAC  
CTCGCGGATATTTATTCTGTCTTTGTTTCGGGGAAAAGAGAGGTTCTTGTC  
S A Y K A R N K P L F S P R T  
G A P I N K H E T S P F S L Q E H  
E R L I S T K Q A P F L S K N T  
ACCACACCATTTCACACACTACATCCTCTGCTTCTTCGAGCCTTTTCGCCT  
TGGTGTGGTAAGTGTGTGATGTAGGAGACGAAGAAGCTCGGAAAAGCGGA  
H H T I H T L H P L L L R A F S P  
T T P F T H Y I L C F F E P F R L  
P H H S H T T S S A S S S L F A

FIG. 19B-3

FIG. 19B-3

Sal I  
 Acc I  
 Hind II  
 Hind II

XCCTTCCTCGTCTAACCATGTCGACCTGCGGCAACTGCGACTGCGTTGAC  
 XGGAAGGAGCAGATTGGTACAGCTGGACGCCGTTGACGCTGACGCAACTG  
 S F L V P C R P A A T A T A L T  
 P S S S N H V D L R Q L R L R  
 X L P R L T M S T C G N C D C V D

INTRON

AAGAGCCAGTGCGTGTAAGTCATCCTCCATCCCTCCACCTCTTCCCCTTC  
 TTCTCGGTCACGCACATTCAGTAGGAGGTAGGGAGGTGGAGAAGGGGAAG  
 R A S A C K S S S I P P P L L L  
 Q E P V R V S H P P S L H L F F F  
 K S Q C V V I L H P S S S S S S

Hind II  
 Acc I  
 Sal I

TTCTTCTTCTTCTTCTTCTAACCTCGCCCCGTTTGTGTTTGTATGAGTCGA  
 AAGAAGAAGAAGAAGAAGATTGGAGCGGGGCAAAACACAAACTACTCAGCT  
 L L L L L L L T S P R L C L M S R  
 F F F F F F P R P V C V V D  
 S S S S S S N L A P F V F D E S

MTZ SEQ B →

CTCTTCCCACATCGCTCGTCAAACTCAGAGCTTTATTAGGGAACATCAG  
 GAGAAGGGTGTAGCGAGCAGTTTTGAGTCTCGAAATAATCCCTTGTAGTC  
 L F P H R S S K L R A L L G N I S  
 S S H I A R Q N S E L Y G T S  
 T L P T S L V K T Q S F I R E H Q

FIG. 19C-1

FIG. 19C-1

| Hinc II

CAATACTATATGTATATGTANAAGGTCAACGTTGGCTGAAGAACTTGGTT  
 GTTATGATATACATATACATNTTCCAGTTGCAACCGACTTCTTGAACCAA  
 N T I C I C ? R S T L A E E L G  
 A I L Y V Y V ? G Q R W L K N L V  
 G Y Y M Y M ? K V N V G . R T W F

| INTION | MT2 Bam/ MT2 SEQ B

TTGCCTTTGCAGGAAGAANGGAAACAGCTACNGTATCNATATTGGTTGNA  
 AACGGAAACGTCCTTCTTNCCTTTGTCGATGNCATAGNTATAACCAACNT  
 F A F A G R ? E T A T V S I L L ?  
 L P L Q E E ? K Q L ? Y ? Y C . ?  
 C L C R K ? G N S Y ? I ? I V ?

CCGAAAANAGGTACTGATTANCTTCTTCTCCCTCCTCCTCGTCGANGATG  
 GGCTTTTNTCCATGACTAATNGAAGAAGAGGGAGGAGGAGCAGCTNCTAC  
 P K ? G T D ? L L L P P P R R ?  
 R K ? V L I ? F F S L L L V ? D  
 T E ? R Y . L ? S S P S S S S ? M

ATCAAACATAATTAGGATTACNCCTTATTAC  
 TAGTTTGATTAATCCTAATGNGGAATAATG → 1880  
 S N . L G L ? L I T  
 D Q T N . D Y ? L L  
 I K L I R I T P Y Y

FIG. 19C-2

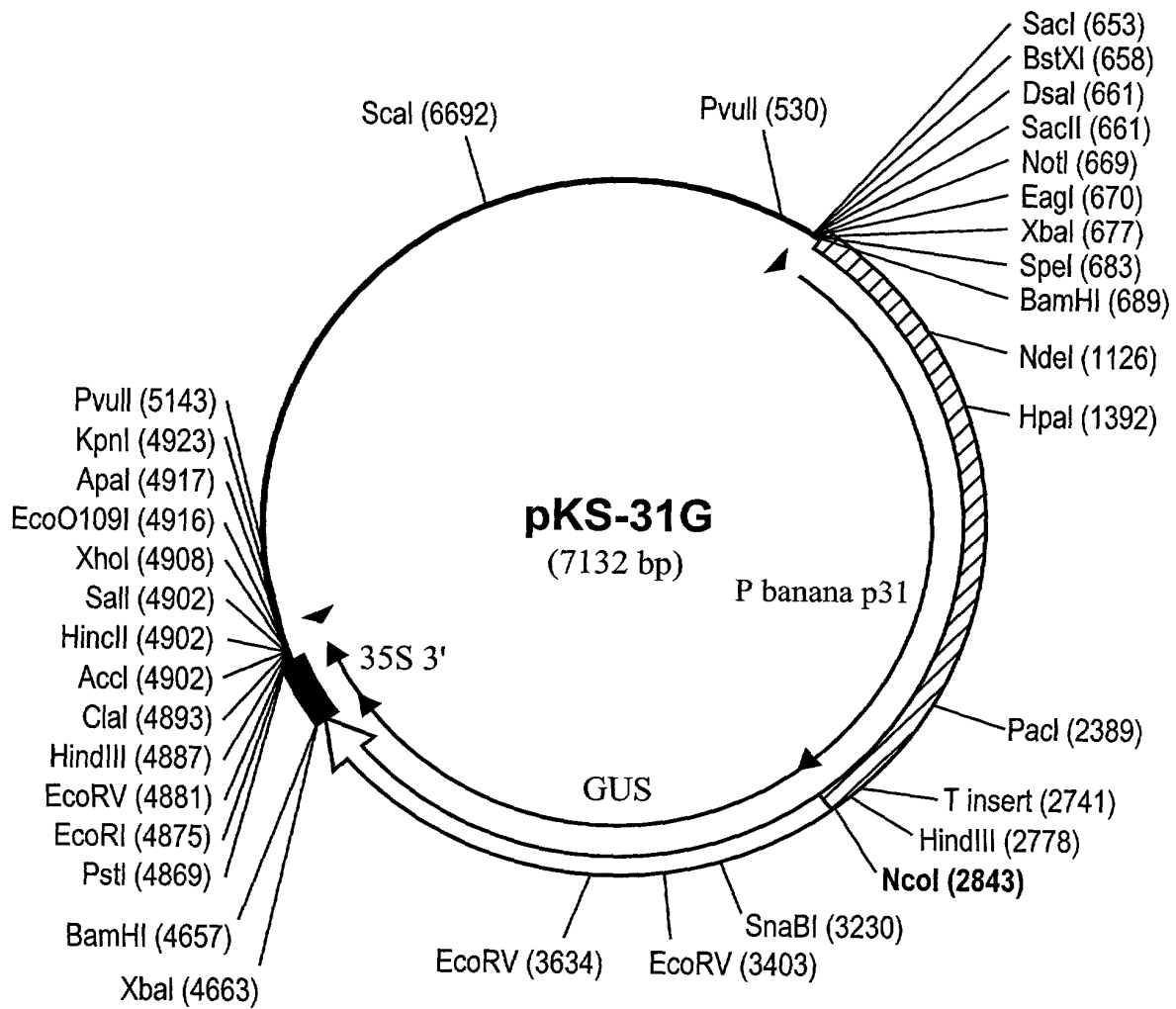


FIG. 20

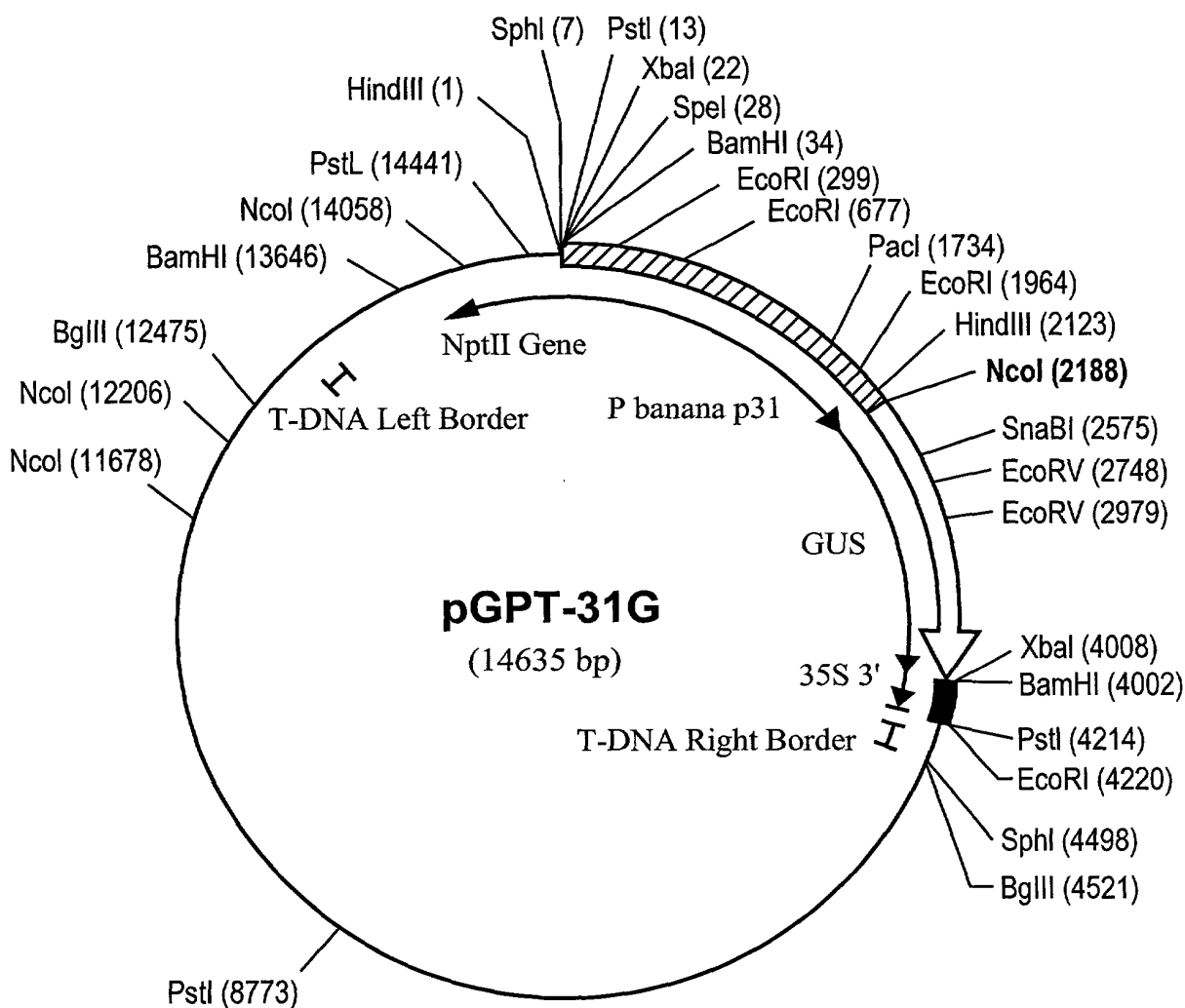


FIG. 21

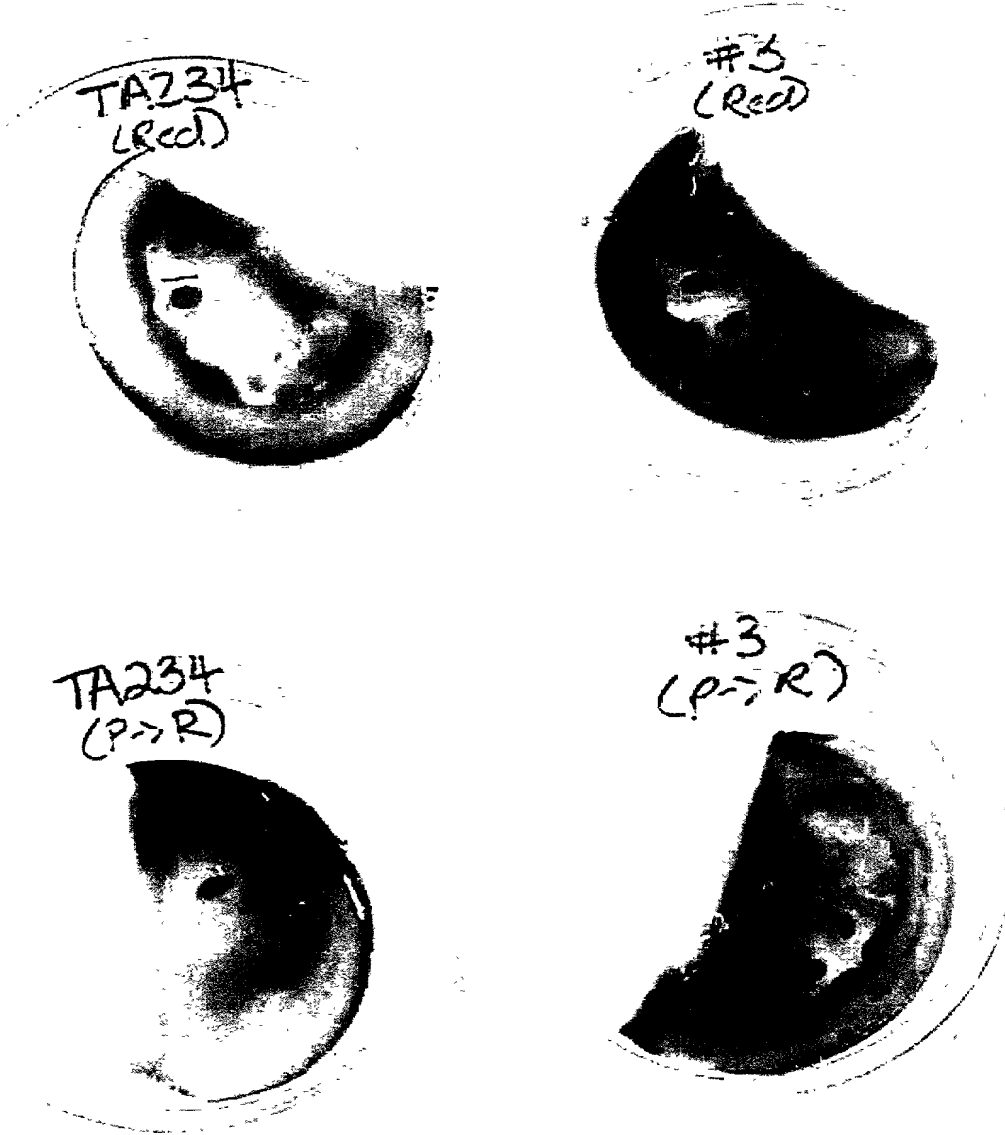


FIG. 22